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ORIGINAL ARTICLES.

COMPARATIVE PROGRESS OF MEDICINE AND LAW.[1]

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HALF a century of study and practice in my profession should have given me some knowledge of the progress of the law and rendered me in a measure capable of indicating its growth. In this branch of my remarks I may hope to interest you in what very naturally is new ground to you. When I come to speak of the advance in therapeutics, I am conscious that I shall be addressing those who know intimately what I know only superficially, and here I shall claim your tolerant indulgence. Yet the thoughts and observation of the laity to either profession ought never to be without interest and benefit to the other. It is not my purpose to decide which profession has made greater progress, but rather to set the facts before you and leave the matter to your own decision.

It would be very difficult to assert the comparative ages of the two professions. Each stretches back to the time when history began to be written. But the law has at once the advantage and the disadvantage of an inspired record. The Decalogue, announced amid the thunders of Mount Sinai has maintained its authority in all succeeding ages. The Sermon on the Mount and the other sayings of Christ were distinct progress in law, introducing more elastic rules of human conduct. But it will be seen that the Decalogue and the Sermon set a hard and high standard of law, and it is difficult to better them or to do little else than apply them to our modern life. Yet no branch of science is perfect when it has become stationary and has ceased to adapt itself to the changing conditions of humanity. Law being the statement of the relations of man to man, and of man to the State, must be judged as to its progress by the progress of humanity.

It may perhaps be said that there was never a more complete digest of law than the famous Pandects of Justinian. It will interest you to know that they were published A.D. 533, in fifty volumes, embracing all departments of law. They were the work of a body of the most learned lawyers and publicists of that age, convened by the Emperor Justinian, and consequently bear his name. While adequate to that day and still authoritative upon many subjects, many of their doctrines have become inapplicable and obsolete by the march of civilization.

[1] Read before the Kings County Medical Society.

To illustrate: Compare the hundred-ton shallops in which Columbus made his voyage of discovery, or the Mayflower of 180 tons burden with the modern trans-Atlantic liner of 20,000 tons. It is easily seen that the law applicable to these little vessels becomes inadequate to the requirements of the greater. Remember that it was only in 1806 that Fulton sent his first steamboat up the Hudson River and only in 1819 that the first steamship crossed the Atlantic. It is amusing to remember that in heavy storms the paddle wheels were folded in upon the deck.

Again, at the time of the American revolution the entire passenger and express business between New York and Boston was transacted by two stages and eleven horses. The first railroad locomotive in America was used in 1829. Now the transportation companies own one-seventh of the entire real and personal property in the United States.

Telegraphy was only invented by Prof. Morse in 1846. It was followed by telephony and wireless telegraphy. These instruments and methods, and the introduction of machinery in manufactures and transportation, with the resulting danger to the life and safety of the individual have changed commercial conditions, and required either entirely new rules of law, or the extension and application of old rules to the new conditions, and it is chiefly along these lines that progress has been made in the legal profession.

But even here it may be said that it is not in legal principles but in their application that the real progress of the law becomes apparent. And here the improvement in the character of courts and judges and lawyers becomes significant. It is only necessary to contrast the infamous Lord Jeffreys, murdering men under judicial forms at the order of King James, or Lord Chancellor Bacon accepting bribes at the hands of suitors and justifying the practice on the claim that it had not influenced his judgment, with such modern judges as Mansfield, Marshall, Jay, Kent and Story.

The lawyer is shackled by precedent. You may appreciate the difficulty of precedent when I tell you of the avalanche of law books which has descended upon the profession. It is computed that over 300,000 decisions are made annually in the United States, 20,000 being decisions by Appellate tribunals. Many of these decisions are inconsistent because announced in different States with differing laws. I am informed by the librarian of our law library that in a single year he purchased nearly 650 new law books, including 150 text-books and 420 reports and 77 digests of these reports, a mass of legal literature under which reason staggers. It is well-nigh impos-

sible to keep abreast of the decisions of courts and the enactments of legislatures. Yet in these decisions the trial lawyer seeks authority for the management of his case and all results in endless litigation. Three centuries ago Bacon, Lord Chancellor of England, recommended to King James the codification of the law of England because there were 60 volumes of law reports. One digest of decisions recently published contains twice the matter of all these 60 reports!

By reason of this confusion, the State has been compelled to resort to statutory enactments, and nearly all advance has been made by that method.

History is saddened by the record of the merciless condemnation and execution of men and women for religious convictions, and this sometimes by legal authority; at other times by self-constituted church tribunals like the Spanish Inquisition, or the decrees of conquering invaders of ancient peoples. These things no longer exist.

Witchcraft was punished with death in the eighteenth century on both sides of the Atlantic, and punishment for this "crime" was only abolished in the reign of George II.

As early as the beginning of the last century in England over a hundred crimes like forgery, counterfeiting, theft, and so forth, were punishable with death. These things form a lurid background against which to paint the foreground of advance. Now, in this State, only treason and murder are punishable with death.

Included in the progress of the law is the treatment of prisoners, both in war and in peace. The mroal sense is shocked by the brutality of Christian authorities to men and women, not only for crimes, but previous to the time of John Howard, for debt. It is a distinct advance that imprisonment for debt is altogether abolished. Criminals now receive merciful and reformatory treatment. Prisons are no longer pest-houses, from whose horrors death is a kindly release.

In early times persons on trial for crimes were not allowed the assistance of counsel in their defence, although the prosecution was conducted by the most learned lawyers of the day. Consider the condition of an innocent and perhaps an ignorant man, confronted with the best legal ability and the whole power of the government, and compelled to conduct his own defence. The right to employ counsel has doubtless saved many an innocent man from judicial murder.

The nineteenth century will ever be memorable in human history by reason of the abolition of serfdom in Russia, and of slavery in the United States. The former was the fruit of peace, the latter of war, but in both cases, law and justice triumphed over the wrongs of centuries.

Comparison of the legal standing of the woman of to-day with that of the woman of the middle ages speaks volumes for progress. In early times she was a serf, a chattel, a painted doll for the amusement of her lord and master. At marriage all her property passed to her husband. Now she stands by his side, his equal in legal rights, is the owner and controller of her own property, with capacity to dispose of it and to make contracts just the same as if she were unmarried.

Perhaps no greater progress has occurred than the institution of trial by jury, now so dear to the Anglo-Saxon heart. I can find no trace of this method of trial in the more ancient laws, but it was coeval with the first civil government of England and was in use in the earliest Saxon colonies, having been ascribed to the mythical Odin or Woden. It was also mentioned in the laws of King Ethelred in the eleventh century. Its use was temporarily shaken by the introduction of the Norman trial by battle, but survived that method in its general scope. Its preservation was one of the main objects of the Magna Charta, which in 1215 was wrested from King John by the English barons in arms.

It is fair to say that there have been some judicial criticisms of trial by jury, but the general consensus of opinion is that it is a distinct advance upon ancient methods.

The trial by battle was introduced into England by William the Conqueror, and it is a curious fact that such a judiciary duel was fought as late as 1638. The trial by battle was waged by champions, and not by parties to the action, because if either of the parties had been killed the action would have abated by the death—in some cases a most desirable end of unseemly controversies. Each champion made oath that he was thoroughly persuaded of the justice of his course and added: "Hear this, ye justices, that I have this day neither ate, drunk, nor have upon me neither bone, stone nor grass, nor any enchantment, sorcery or witchcraft, whereby the law of God may be abased or the law of the devil exalted, so help me God and His saints." The battle thus begun, the combatants were bound to fight, if necessary, till the stars appeared in the evening.

Corporations are of comparatively recent creation. They grew out of the principle that investments on a scale adequate to large enterprises ought to be possible in such a way that men might put at use definite portions of their property without the risk of losing all. In my opinion, it was patterned upon the ancient maritime law as to ownership in vessels, by which an owner's loss, in case of collision or other disaster, was limited to his interest in the ship.

Out of corporations have grown the momentous operations commonly known as trusts. They are still in their infancy, but new enactments are guarding against the evils which at the present time seem to threaten the interests of the commercial world.

Another evidence of progress may be found in international law. For many centuries that law has been unwritten, that is, not statutory. Like our common law it was not wholly written, but was embodied in diplomatic and judicial decisions. In the last and the present century there have been international congresses to settle matters of this nature like the International Marine Conference of 1889, upon matters relative to

navigation, the Treaty of Paris in 1856, by which, among other things, privateering (a legalized species of piracy) in time of war was abolished, and the rights of neutrals defined. The reports of these conferences were subsequently adopted by legislative action of the Great Powers, and thus made permanent statutory international law.

The Geneva Conference upon questions arising from the depredations upon our commerce of the Confederate steamers built in England during the Civil War undoubtedly prevented war between the United States and England. All mark positive advance upon ancient methods and laws, and will hereafter in large measure prevent war.

But the most notable of all advances in the law is the Constitution of the United States. Gladstone pronounced it to be "the most wonderful work ever struck off at a given time by the brain and purpose of man." John Fiske calls it "The Iliad, the Parthenon, or Fifth Symphony of Beethoven."

Under its power liberty and a great nation have become possible, permanent and inseparable. Freedom in thought, in action, in choice of rulers, in worship, so sharply contrast with feudalism and monarchy and oppression, that men of all nations are flocking to our shores to become part and parcel of the grandest nation of the ages, a nation which, in the first century of its existence has increased its population from five to seventy-five millions, and extended its territory from a narrow fringe on the Atlantic, until it has crossed the continent, and from its western shore looks across the Pacific to the land where civilization had its birth.

It is not wonderful that looking upon this marvelous growth, so conservative and English a statesman as Lord Rosebery has predicted "the sublime transference of political power and the seat of empire from the Eastern to the Western hemisphere."

I have thus in a cursory manner indicated the salient features of progress in law. Is it too much to say that the law has lifted the world to a higher plane of civil and religious liberty and has increased the sanctity of human life and happiness, and that under its benign influence the world grows better with every passing year?

Coming now to consider the advances in medicine, I am somewhat amazed at my audacity in speaking to you upon that subject. I do this with hesitation and only for the purpose of opening the discussion by yourselves. Let me premise by saying that upon this branch of my subject I am much indebted to my friend, Dr. John C. Minor, and to a study of the admirable review of Dr. William Osler, published in 1901.

While I have spoken of the great antiquity of the law, I have not lost sight of the equal antiquity of medicine. Æsculapius, reputed son of Apollo, seems to have been the mythical demigod of your science. His school in surgery has been immortalized by Homer in his Iliad, and he has been for ages regarded, not altogether without reason, as the founder of the science of medicine. Notwithstanding the fables interwoven with his history and detracting from its credibility, we can collect enough from it to be fully persuaded that his talents must have been of the very highest order, and that his knowledge must have appeared supernatural in the days of darkness and superstition in which he lived. On his death, he was elevated by his contemporaries to the dignity of a god, and temples were erected to his memory in various places, in which he was worshipped with divine honors. These temples of Æsculapius were the first medical colleges in existence. As schools of medicine, they differed in their measure of fame, in the nature of their doctrines, and in the method of their practice. It is related that he treated mental disorders with music, certainly a method not fraught with the danger of poisonous drugs. He had two sons, one of whom practised surgery and the other medicine in its general sense, and the division of the profession into surgeons and physicians apparently originated with them.

Hippocrates lived in the fifth century before Christ, and was possibly the most advanced physician of his and previous ages. It is hardly worth while to enter into the various doctrines that prevailed in the medical profession prior to his time. They were largely fanciful and childish and, as medical teaching was in a great measure absorbed by the priests of the temples, it became naturally a sort of medical philosophy in which the hallucinations of the imagination were allowed to usurp the place of observation, and the most puerile theories to supersede the cautious deductions of reason and experiment.

With the exception of Pythagoras, who was born in Samos about 600 B.C., there were none who contributed notably to the advance in medical knowledge until Hippocrates began a life devoted to studies in medicine that has made his name venerated for more than twenty centuries, and whose authority commands respect, even at the present day. Any one who studies his writings is astonished at the extent of his observation. The chief feature of his teaching was that disease is just as much a process governed by natural laws as life itself, that the process could be known by observation of symptoms which indicated the spontaneous and normal direction of recovery. Added to this was a careful attention to diet adapted to each kind of disease. He regarded medicines as of minor importance, although he mentions over 250 different drugs. His grand object was to purge medicine from the false doctrines which disgraced it, and to establish its fundamental principles on a solid and rational basis. He was a strenuous opponent of the dangerous doctrine, inculcated by the priests in almost every age, of the celestial origin of disease. He exposed the imposture of those who, masking their ignorance under the veil of piety, pretended to subdue, by charms and incantations, those complaints which they had not the skill to

encounter with the weapons of art. He taught that actual experiment, patient investigation and careful deduction were the foundations of medical science. He recognized the importance of nature in the cure of disease. He was the first to observe and describe accurately the minute circumstances of disease, the first to realize the importance of dietetics in its prevention and cure, the first to establish clear methods of diagnosis and prognosis; in a word, he was the first great clinical teacher, and for all time will be regarded as the father of rational medicine.

After the time of Hippocrates, medical progress seemed to suffer a relapse into the old ways of superstition. Much that he had taught was either forgotten or so perverted by erroneous doctrine that when Galen flourished it was full time for another revival in medicine. He lived in the second century A.D. and seems to have furnished the standard by which we may judge of progress in therapeutics. His reputation is founded not so much on original investigation as on his revivification of the doctrines and practices of Hippocrates, yet he was an acute observer, and left the impress of his genius and industry on nearly every department of medicine. He paid general attention to anatomical and physiological research and practised dissection of animals, dissection of the human body being forbidden by the religious sentiment of the age and practically illegal. His theory was that drugs contained the same elementary qualities as the body, heat, cold, moisture, dryness, etc., and that on the principle of curing by contraries, the proper drug was indicated.

It is not my intention to follow the history of medicine through the middle ages. The examples I haven given merely go to show that in ancient times about once in 500 years a medical genius was born into the world, who had something to say worth listening to and something to do worth copying. In the sixteenth century Ambrose Paré in France made his mark in surgical practice by ligating blood vessels and by improved methods of treating gunshot wounds. During that century anatomy and physiology were advanced by the studies of Servetus, Vesalius, Fallopius and Eustachius. Harvey also made his notable discovery of the circulation of the blood. The century was, in fact, the most remarkable one in the development of the more scientific departments of medicine.

I make no apology for passing over the times of Sydenham, Boorhaave, Haller, Cheyne, Huxham, Currie, Rush, Cullen and the early part of the eighteenth century, and the practice of inoculation by Jenner.

It was not, however, until the nineteenth century that the great problems of anatomy and pathology aroused scientific investigation. Bichat in 1801 placed the seat of diseases, not in the organs, but in the tissues of which they were composed. This, associated with Lainnec's art of auscultation and Avenbrugger's method of percussion, and Bright's researches on kidney diseases, resulted in differentiation of the fevers, in experimental investigations to determine the functions of the organs in health, in researches as to digestion, assimilation, circulation, respiration and excretion, with specialist investigations of all the organs, until science seemed to have explored every portion of the body. The result of these investigations was simply the building of a plane from which new efforts have been made and new results attained in every branch of therapeutics.

Dr. Osler says in his article, "Sanitary science, hygiene or preventive medicine may claim to be one of the brightest spots in the history of the nineteenth century. It is concerned with the causes of diseases quite as much as with the conditions under which these diseases prevail." Here bacteriology, as used by Pasteur, Koch, Cohn and others, was of incalculable help. Bacteria have been demonstrated to exist in rabies, fevers, leprosy, cholera, tuberculosis, pneumonia, la grippe, diphtheria, malaria, tetanus and many other diseases, and the prevalent method for preventing these diseases has come into general use.

It is well known that to a certain extent the blood and tissue cells have the power of killing germs, and this is called "general resistance." The problem has been to afford the system additional force in destroying the toxins and preventing disease where the system has partially or wholly lost its normal power of resistance to the attack of the microbes, and here the new healing art of serumtherapy finds its province in the use of antitoxins.

We come now to a period in medical science when not so much is heard of the individuals whose work advances the profession, but whose results are known to all. In old times, when a physician made a notable discovery, which was a distinct advance in medical science, his name became famous and public honors were accorded him, and all the while the vast majority of the profession remained in ignorance of the new facts and plodded along in the same old routine of practice. But to-day, when a new experiment is crowned with success or an original investigation brings a new thing in medical science to light, the whole profession is alert to seize and utilize the knowledge, while the one who has made the discovery is probably unknown to those outside of the profession. It is because I am outside of your profession that I am unable to recall the names of those who have done so much to advance the science of medicine within the last half century, but it is within my recollection that during that time the lancet has been folded up and laid on the shelf, fresh air and water have been let into the rooms of patients with fever, and the clinical thermometer and other instruments of precision have been introduced into practice.

During this period bacteriology has become known and by its application a flood of light has been thrown on the origin of disease. The study of these minute organisms has made surgery a new science and given to medicine some of its

most marvelous remedies. The use of antiseptics in surgery as a method of preventing inflammatory complications and germ contaminations belongs to that department of medicine that deals with the prevention of disease, and which in its larger sense is termed hygiene.

Doubtless the attention paid by the profession to anatomy has been the basis and reason of progress in surgery. Added to this is the discovery of anesthetics and antiseptics, by means of which surgical operations which startle the laity have become commonplace to the surgeon. The Roentgen rays, anesthetics and antiseptics have made miracles possible. A recent incident astonished the lay world. I refer to the treatment of a patient who had collapsed under an anesthetic. The attending physician quickly opened his thorax and taking the heart in his hand gently massaged it, so as to imitate its normal action and the patient's life was saved.

It may be deemed heretical in this body to say it, but it seems to us of the laity that Hahnemann rendered distinct service to medical science, not so much by his theory of *similia similibus curantur*, which was diametrically opposed to the theory of Hippocrates and Galen, as by inducing the use of smaller doses of medicine. A curious experiment was tried in the Massachusetts General Hospital in Boston. The story is told by Dr. Bellows, an allopathic physician. Three wards, exactly similar in all respects, were assigned, one to the allopathists, one to the homeopathists, and one to the eclectics. Patients (not surgical), as they came into the hospital, were assigned in strict numerical order to each ward. The result at the end of the year was that the percentage of deaths in the allopathic ward was six per cent., in the homeopathic ward four per cent., and in the eclectic ward, two per cent.

As in this connection, I may say that much has been learned from that true homeopathic physician, Doctor Mosquito, who alone of physicians, continually carries his scalpel-probe on that part of his anatomy where it is calculated to be most effective. His professional brethren have been swift to apply the knowledge of his practice in the treatment of their own patients.

Another advance is the absolute change from the old irresponsible certification of physicians to their regulation, not only by education, in the great medical colleges and the issuing of diplomas, but by the positive prohibition of the State against the practice of medicine, except by educated persons holding such degrees. The severer the tests and examination, the better for the public health and for the medical profession.

Positive progress has also been made, not only in the treatment of the insane, but in the study of the causes of insanity and idiocy. This has extended to all civilized nations, and these unfortunates are no longer regarded as unworthy of care and study.

The trained nurse is a most remarkable evidence of medical progress. We need only to compare Betsy Prig and Sairy Gamp abusing poor old Chuffey in "Martin Chuzzlewit" with the educated, informed, neat-handed, watchful young women, who make sickness comparative luxury, and to remember that symptoms and conditions are watched and reported to the physician with a faithfulness born of enthusiastic devotion to what ought to rank as a learned profession. I am always proud to remember that the first State school for the education of nurses was established in the Brooklyn Maternity, for which I drew the incorporation papers, and in which my wife was a faithful worker for many years.

In dietary matters, however, there seems to me to have been a decided lack of observation. I do not mean diet to the sick, for that receives the utmost attention—I mean attention to previous diet. I can hardly recall an instance, in my own experience, where my physician inquired of me what my previous general course of diet had been in order to acquire diagnostic knowledge of my condition and its cause.

We have learned so much, during the past fifty years, of the avoidable causes of disease that it gives rise to some natural queries. For instance, malaria and possibly yellow fever is known to arise from an infection carried by the mosquito; mosquitoes are killed by drainage or by covering the surface of their breeding places with a film of petroleum. Query, why should not the mosquito be utterly abolished and wiped off the face of the earth by a scientific application of the means at our disposal?

Again, the tubercle bacillus is recognized as the probable cause of true tuberculosis. This bacillus lives and germinates in living animal matter only. If every tuberculosis animal is either isolated or killed, why should not consumption be afterward unknown on earth?

Typhoid fever ought to be a preventable disease, requiring a proper sewage disposal that will destroy all germs, so that there would be no possibility of contamination of drinking water or food products. Would not systematic control of sewerage systems by government abolish typhoid fever?

Is it fair to compare the progress of our professions by results? Yes, in a measure, for we practice upon the knowledge at our command. The Bible declares, "By their fruits ye shall know them." The fruits of a lawyer's services to his client are gathered or lost at the end of the lawsuit. The result is concrete and apparent. But we must start with the fact that in all cases one of the opposing lawyers always loses. Hence each lawyer theoretically loses half of his cases.

Here I admit your great advantage. Your single adversary is the Grim Reaper. What is your proportion of successful contests with him? We lawyers may not hide our mistakes under any Hippocratic oath. Far be it from your servant to suggest that *you* ever make mistakes!

A lawyer and a doctor were riding past a gallows bearing its ghastly fruit in chains. The doctor said, "There hangs the victim of your legal mistakes." Presently they passed a

cemetery and the lawyer said, "There lie the victims of your medical mistakes." In both cases, however, dead men told no tales.

But we have this advantage: We advise and act upon the facts as related to us by our client. You can only diagnose, necessarily with difficulty, because partially, upon symptoms described by a sick patient's fancies. You may not see inside the body except by the imperfect X-rays. The wonder is that you accomplish so much as you do.

Sometimes, especially when I have lost an important lawsuit, I have doubted whether lawyers, except in rare instances, are of benefit to the world. But there never was doubt as to the physician. We envy you the power of ministering to humanity, of ameliorating suffering, of saving the dear lives of men and women and little children. Verily the good physician is God's vicegerent on earth.

HIGH-FREQUENCY CURRENTS; THEIR PHYSIOLOGICAL ACTION AND METHODS OF APPLICATION.[1]

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FOR many years, thanks to the researches of D'Arsonval, Oudin, Doumer, and others, high frequency currents have been employed in Europe in electrotherapy. The field of their application has constantly widened, but it is only within a very short time that their value has been recognized in this country.

The question is very frequently asked, what are high-frequency currents, and it may be said that they are the extremely rapid isochronous oscillations which are obtained when a condenser charged to a high potential is discharged into a conductor having a certain self-induction and feeble resistance. They are in reality currents of high potential as well as high frequency. High frequency enables us to obtain extremely high tension, the latter being necessary for the experiments investing high frequency properties in light. The theories as to the nature of light have been modified in late years, and the resulting experiments have founded the electromagnetic theory; the identification of electric and light phenomena. According to these theories, the phenomena are due to a periodic movement of the ether. The two phenomena present striking analogies, and one is obliged to admit that electric and light vibration differ only in frequency and wave length.

From a physical standpoint, high frequency currents are distinguished by three properties which are due to the great frequency and the high tension put in action. These are as follows:

First.—Very intense phenomena of induction. The electromotive force induced in a conductor by a neighboring conductor is in proportion to the product of the current by the frequency. Therefore, the electromotive force induced either by the self or mutual induction in a single spire is very great, and in a large solenoid will by the mutual induction light an eight-volt one ampere lamp. Auto-conduction is an application of this principle, one utilizing in this case the currents induced in the circuit formed by the mass in the human body, or certain parts more conductive.

Second.—Since the least capacity enters into play, high frequency currents circulate as well in open as closed circuits, so that contact with a single pole suffices to furnish the current. However feeble the capacity may be, the charge and discharge is repeated hundreds of thousands of times per second under a high tension, and it is this which explains the unipolar currents and the sparks which are obtained when a single spire of the solenoid is touched. In this case the body constitutes an insulated circuit which, at each oscillation, is charged with an almost constant quantity, since it is at a certain distance from the solenoid. The opposite charge must be found on the poles of the solenoid which are of a different potential.

The illumination of the lamp may be explained by the effects of condensation; the glass being the dielectric, the vacuum and the filament forming one electrode, the moist skin the other.

Third, Phenomena of Resonance.—This will be described under methods of raising tension.

While Hertz, Tesla, Thomson, and others studied these currents from the standpoint of their industrial utilization, D'Arsonval made his researches from a purely physiological point of view. His experiments extended over a period of several years, and have established the fact that high-frequency currents are valuable electrotherapeutic adjuncts.

SOURCE OF HIGH FREQUENCY CURRENT.

These currents are obtained in many ways, and many ingenious devices have been employed for furnishing them. A coil or a static machine may be employed as the exciting apparatus. D'Arsonval employed a low frequency coil provided with condensers, the outer coating of which was connected to a solenoid of coarse wire.

The phenomena of the generation of high-frequency currents from whatever exciting apparatus employed, may be explained as follows: At each rupture of the primary circuit there is produced an induced electromotive force. This electromotive force charges the condensers to which is united the solenoid; the solenoid itself being traversed by the current of charge. In proportion as the charge is effectuated, the difference of potential at the discharge rods of the condenser increases, and when it reaches the limit corresponded to the separation of the balls of the discharge rod, perhaps many thousands of volts, the spark breaks. This spark forms a bridge of feeble resistance by which the charge of the condensers is quickened. The oscillating discharge leaps from one ball to the other, during which the solenoid attached to the external armature of the con-

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denser is traversed by an alternating high-frequency current. The interval of the micrometer is then traversed at the time by a spark of unique direction due to the coil, and by the oscillation of the condenser charge, while the solenoid is only traversed by the condenser discharge and the oscillation of the discharge. The first being relatively slow, cannot give in a conductor resistance of any appreciable tension, so that the only difference of potential which can exist there are those due to the oscillation, which are inoffensive.

PHYSIOLOGICAL PROPERTIES.

The physiological properties of high-frequency currents may be considered under four heads: Their action upon the nervous system, the circulation, the respiration, and the urine.

Action Upon the Nervous System.—An essential property which distinguishes high-frequency currents from all other forms of electrical energy, even when currents of formidable intensity are employed, is that it exercises no action either upon the general sensibility or muscular contractility, there being experienced only a slight sensation of heat at the point of entry and departure.

When sparks are allowed to fall upon a motor point, or upon the skin, there is an action upon muscular contractility which might lead to conclusions that the nerves were impressible to the current. This action upon the sensibility and the pain is caused by the very great density of current and the shock of the spark at the point of penetration. The area treated being very small, the passage of the current develops considerable heat. Small electrodes in immediate contact with skin may set up a sensation of heat which may be disagreeable, whereas large electrodes diminish the density and diffuse the heat. The muscular contractility caused by the spark is due to the discontinuity of the discharge, the brisk variation of the electromotive force corresponding to the establishment and breaking of the spark.

These facts, then, permit this fault of action to be attributed to the extreme elevation of the frequency of the current, our nerves being incapable of responding to excitations so rapid. There is therefore absence of sensory or motor excitation, inhibitory effects, and effects upon the vasomotor system as shown by fall of arterial pressure. The analgesic action in certain cases can be carried so far as to obtain complete local anesthesia. This does not penetrate deeply, and persists from a few minutes to a quarter of an hour. Oudin has shown that the spasmodic anemia produced at the point struck by the spark from the resonator extends for two centimeters succeeded by a true local trophic trouble. There is a slightly painful sensation at the beginning of the operation, which soon becomes absolutely painless.

Action Upon the Circulation: Direct Application, Condensation—There is a vascularization of the skin which is covered with sweat consequent to the action upon the vasomotors. Variations in resistance of the capillaries necessarily excite modification of the arterial pressure. This is diminished if the small vessels are dilated, increased if they are contracted.

When the spark of the resonator is directed upon the skin, one sees about the point touched from 20 to 30 cm. circumference a diffused redness extending to large areas, persisting 20 to 30 minutes with papillary erection, followed by anemia due to a very energetic vasoconstriction. After some instances an erythematous tint may remain many hours, or in some patients many days. One obtains by this process a greater increase of the arterial pressure than that which one establishes after auto-conduction. Oudin has by means of the sphygmomanometer of Laulaine shown that when the effluve of the resonator touches some point of the body there is instantly produced in the capillaries of the hand of the subject a vasomotor spasm characterized by a notable lowering of the general curve. He has sometimes established in the same time a diminution of the amplitude to the pulsations, sometimes almost complete suppression. It presents, nevertheless, before returning to its normal form and amplitude, alternative periods of lowering and elevation which seems at times to produce a series of vasocontractions and vasodilatations less and less accentuated.

Action Upon the Respiration.—Under the influence of the high frequency currents, the number and amplitude of the movements of the respiration increase, and D'Arsonval has shown that the volume of oxygen absorbed and the carbonic acid emitted increases considerably. The examination of the blood made by Tripet before, during, and after treatment at the Apostoli Clinic upon patients affected with different affections, showed that in 37 cases the high-frequency currents increased the activity of the reduction of the oxyhemoglobin in patients with lowered nutrition. In ten cases where before treatment the activity of reduction was exaggerated, the current caused a lowering, approaching the normal. In only six cases the organic loss continued to lower in spite of treatment.

Action Upon the Urine.—By the direct application D'Arsonval has shown that high-frequency currents regulate diuresis, increasing the elimination of extractives, notably urea and also increasing the toxins.

Apostoli and Berlioz made 761 chemical analyses upon 281 patients, and showed that high-frequency currents caused amelioration of diuresis and more easy elimination of excreta, a greater suractivity of combustion, with a tendency of the relation of uric acid and urea to approach the normal average, 1.40. Berlioz noticed with condensation that the nutritive processes appeared more active, that urea, uric acid, phosphoric acid and chlorides were notably increased. Real and Rienzi demonstrated that this treatment diminishes about one-half the neutral or not completely oxidized sulphur contained in the urine. They attribute, moreover, a manifest action upon nuclein shown by the simultaneous increase of uric and phosphoric acid.

Methods of Application—High-frequency currents are applied under different modalities, one utilizing, as the case may be, either direct applications, local applications, auto-conduction, condensation, or resonator applications.

Direct Applications—It is known that high-frequency currents circulate in a solenoid, and a patient being in shunt by being attached to the two points will be traversed by the current. As a consequence of self-induction the solenoid offers a greater resistance, and the current, therefore, passes by preference through the shunt circuit of which the patient forms a part.

In the direct stable application, the patient is connected to the two poles of the solenoid by means of conducting cords attached to metal plates of different dimensions, or covered with moistened felt or chamois and applied directly to the skin. The metal plates should be of such a thickness as to be easily molded to the surface. Care should be taken when applying them to the diseased area to see that there are no folds of the covering, or air spaces between the metal and the skin, for the reason that if this is overlooked ulcers or burns may occur.

Labile applications are made by having one fixed attachment, the other end of the solenoid being attached to an insulated movable electrode.

Local Applications—In local applications a point, wire brush, or metal ball such as are commonly employed for static treatment is attached to one pole of the solenoid by means of a flexible insulated cord. The other extremity can be connected with the patient by means of a large tin plate, attached to the earth, or left free. If one pole of the solenoid is attached to the earth, a greater potential is created at the opposite pole and a larger effluve is obtained.

REACTION PROVOKED BY DIRECT AND LOCAL APPLICATIONS.

The immediate impression experienced by the patient is almost nil, there being only a light sensation of heat at the level of the electrode, or in its neighborhood. On the contrary, if the application is defective, the patient can experience a sensation of burning and slight erythemia. Some patients cannot support the temperature to which a carbon tampon is carried covered with soft wool and ulcerations may occur; others experience a sharp pain when one throws the current into circuit, which pain must be related to lesions of the skin subjacent to the electrode, since it is sufficient to displace this in order to cause the cessation of all disagreeable sensations. There is also noticed in some cases an analgesic action, vasomotor resolution. Lassitude is sometimes observed following the seance persisting for some hours or localized for five to ten minutes.

ELECTRODES.

Different electrodes are used for local applications. Those most commonly employed are metallic brush, point, multiple point, ball, or some form of glass vacuum tubes exhausted to a Geissler or Hittorf vacuum.

The metallic brush should be composed of very fine flexible wire, and is employed in chronic affections of slow progress without any inflammatory reactions. Where effluvation of a limited area is desired, a metal point should be employed. This should have a very sharp pencil point. Where a diffuse application of the effluve is desired, the multiple point may be employed.

For the treatment of sensitive surfaces, as the face or mucosa, or any region where inflammatory reaction has increased the sensibility, glass electrodes should be used. Many types of glass vacuum electrodes have been devised for this purpose. The type I prefer is that provided with a wire running to within one-half an inch of the distal extremity of the tube, and exhausted to a Hittorf vacuum. These may be termed a condenser which discharges itself at each oscillation by a shower of fine, small, and violaceous sparks. These sparks are easily supported by the most inflamed skin or delicate mucosa. Different types of these electrodes are shown in Figs. 1 and 2.

If one approaches the skin with an electrode attached to one pole of the solenoid without completing the circuit by a contact with the other pole, sparks occur which provoke a revulsion much more lively as the action is prolonged. This revulsion is followed at first by a light localized redness very quickly diffused and extending to a surface sensibly greater than that attacked by the spark. The redness persists from twenty-five to thirty minutes after electrization. About the point touched a sort of anemia of the skin takes place, which becomes a chalky white with erection of the papillæ. This condition persists for one or two minutes, according to the subject, then the papillary erection little by little disappears, and the spasmodic anemia of the beginning is succeeded by quite a strong erythematous tint which sometimes persists for several hours. In certain subjects with particularly sensitive skin one can even notice the next day the presence of the erythemia. Oudin (*Annales d'Electrobiologie*, 1898) declares that one can even see "if one prolongs the local action after several hours a phlyctenula at the point touched."

When the opposite extremity of the solenoid is attached to the earth and the electrode is in connection with the patient, the effects are a little less accentuated. It is not easy to utilize the effluve exclusively, because, being almost the same length as the spark, but a slight displacement of the electrode is necessary in order to obtain a spark.

Direct sparks may be administered locally by attaching an electrode to one of the extremities of the solenoid of the exciting apparatus. If the other extremity of the solenoid is grounded or attached to the patient, the sparks are more powerful. This method of application is very little employed on account of the painful sensation arising from the spark. This can be lessened to a degree by replacing the ball or point with a metallic brush, thus diffusing the action to a larger surface. The current, however, is still painful to a

healthy skin and intolerable to a diseased one. The boundary line of the spark and effluve is very short with this application as a very slight difference in the distance of the electrode from the area under treatment causes the spark to jump. For this reason this method of application is very little used. To overcome this one may use either a Tesla coil or the properties of resonance, the last being the means most generally employed. The local applications are thus easily controlled and well tolerated.

The principle of resonance is founded upon the fact that two sonorous bodies may be so constructed as to vibrate in unison yielding the same tone. When this is accomplished it is only necessary to vibrate one to cause the other to enter into vibration. This phenomena is also present in electric vibrations, and Hertz being aware of this fact constructed an apparatus of feeble self-induction and capacity under the name of resonator. This was so constructed that the period of the resonator furnishing sparks coincided with the period of the vibration of the exciting apparatus, and was itself the seat of oscillations.

The diameter of the spires of wires constituting the resonator has no great importance from the standpoint of the production of resonance, but it has a considerable influence upon the physical property of the effluve and spark. If one employs a fine wire one obtains a spark, weak, long, and sinuous, slightly painful, the effluve being also much less nourishing. With a wire of greater diameter the effluve and spark gain in power, these being in relation much more with the total capacity of the exciting apparatus than with its self-induction. It is for this reason that the capacity of the Leyden jars must be feeble.

The maximum speed of a resonator depends upon the establishment of a perfect pitch between it and the solenoid of the producing apparatus. This result is obtained by varying the number of spires in the circuit, thus modifying the self-induction and the capacity. Having established the pitch of the solenoid and resonator, if one changes the relation of the self-inductor or the capacity, they do not vibrate in unison, and the effluve or sparks become smaller and smaller and finally disappear.

Oudin in 1892 devised the first resonator employed in electrotherapeutics, consisting of a solenoid of copper wire, which by a given relation between the number of its turns and the number of turns of the primary solenoid of the exciting apparatus gave a bouquet of effluve or sparks.

His new model is an inducto-resonator, and as consequence of superposition of the primary solenoid upon the prolongation of the resonator, it adds to the phenomena of resonance that of induction.

A new inducto-resonator manufactured by Van Houten & Tenbroeck Co. has proven very satisfactory in my hands. This is so constructed that direct, local, or resonator applications may be made. The effluve is very large, varying from one to four inches. The current strength is regulated by the distance of the discharge rods, attachment to resonator or coil posts or grounding. The yield is superior to that of any other apparatus, and affords a more extended and delicate production of its effects. This is shown in Fig. 3.

The current furnished by the resonator, or the high tension coil, whatever it may be, can in fact be applied to the patient in many ways. The application may be continuous or discontinuous. It is continuous if one employs a copper electrode in immediate contact with the skin or the region to electrolize. It is discontinuous if one employs a wire brush held at a distance, or better, a glass electrode. A brush of metallic wires promenaded upon the skin presents, however, less discontinuity than in the case where the same broom is held at a distance. This distinction has its importance because the reaction of the patient produced by these different applications is different. Local application can moreover be monopolar or bipolar.

Certain apparatus permit of submitting the patient to the effluve or the sparks furnished simultaneously by the two poles of the resonator or the high tension coils. In this case the two poles are active, if one can express it thus, but one can still realize a bipolar application in attaching the patient by an indifferent electrode to the extremity of the solenoid opposite to the pole connected with the resonator. Finally, one can attach one extremity of the solenoid of high frequency to the earth, or better, not connected either with the patient or the earth. In discontinuous applications the effects are varied by modifying the distance of the electrode to the region submitted to treatment. If one wishes to increase the action of the effluve through the body in a determinate direction, one can place upon the region opposite to that where it is applied an indifferent electrode which one uses in the bipolar applications.

The same rssults may be obtained in different conditions by means of a process indicated by Oudin. The lines of force of the oscillations in the body of a patient attached to the resonator can, in fact, be directed in a certain measure towards a determinate region by approaching to the point upon which one wishes to act more particularly a capacity, such as the hand, for example, or a sphere. Break the sparks between the capacity and the body, as the sparks are longer as the density of the current is greater, that is the surface of contact is much smaller. Curiously these sparks are more disagreeable when the patient is struck by the effluve than when he is in direct contact with the resonator.

Glass electrodes diminish and even suppress painful impressions. The anemia of the skin, the erection of the papillæ, and the redness which appears successively in the course and as a consequence of the application, depend upon the intensity of the treatment. The revulsion can be intense and go as far as a vesication if the sparks are particularly powerful or if they are applied for a very long time and very often repeated in the same place. After the seance the patient gener-

ally experiences beside a sensation of heat an impression of local well being. The skin is soft and moist. Often, either during or after the application, one sees small drops of sweat covering the integument.

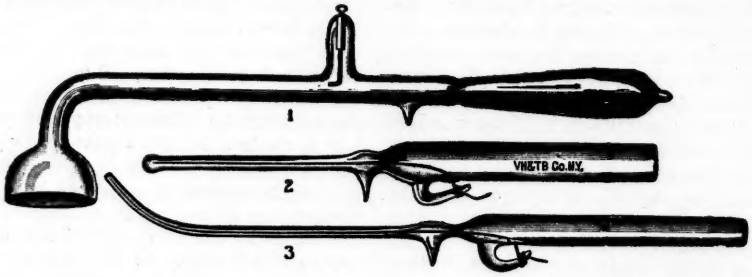
Oudin gives the following hypothesis as to the action of the effluve of resonance. He believes that the skin acts as a dielectric and is traversed with the greatest facility by the effluve which charges the capacity formed by the adjacent tissue to the effluve; it acts as a volumetric capacity which will be submitted to the electric oscillations, spreading itself in all its mass, slowly decreasing, and not as the internal armature of a condenser of which the epidermis may be the dielectric. The alternate waves appear from their point of entry in the body to diffuse in the mass of the organism as the stretch from the surface of still water, parting from the point which has been struck by a stone, or more exactly as sonorous waves expand in the air from a vibrating cord. (*Annales d'Electrobiologie,* 1898.)

Reaction Provoked by Local Applications Affected by Means Which Raise the Tension.—The reaction of the patient varies equally with different conditions. Heat is often produced by the high-frequency currents, as may be noticed when an electrode is taken in the hand and one is struck by the sensation of heat rapidly developed at the points of contact. Oudin has demonstrated that the quantity of energy which circulates in a conductor is relatively considerable and quite superior to that of static machines. (*Annales d'Electrobiologie,* Aug., 1899.) The sensation of heat is specially appreciable when one applies a metallic brush to the skin or when one draws some sparks.

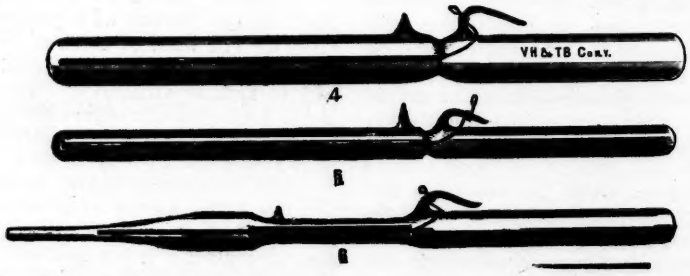
From the standpoint of their immediate action, the effluve and the spark differ much. The effluve provokes only a slight prickling, and is in general well borne. The sparks are more or less painful, according to the condition of their application. They are supported in a variable manner according to the susceptibility of the patient.

INTENSITY, NUMBER AND DURATION OF SEANCES.

The intensity of the current is varied by changing the number of the spires of the solenoid introduced into the circuit. One can modify the point of contact of one of the rheopores upon the solenoid, the other remaining fixed at the same point. Thus one approaches or removes the two doses of the current more or less; but this process has the inconvenience of prolonging the uncertainty necessary to obtain the desired intensity.



It is hardly possible to indicate the necessary intensity to employ. The physician must in each case proceed with caution. Watch with care the first seances of the treatment, and the reaction of the patient will quickly inform as to the advisability of a diminution or an increase of intensity. One cannot fix the rules relative to the duration of seances or their repetition. In general, prolong the application ten minutes and administer three times a week. In certain cases, fifteen-minute applications or daily repetition have appeared to accelerate the amelioration. The conditions must vary with the nature of the disease and the tolerance of the patient.



Auto-conduction is distinguished from all other methods of electrolization by the absence of all contact establishing a communication between the current and the patient. The subject is placed in an oscillating magnetic field engendered in the large solenoid without any communication with it. The solenoid, being traversed by the high-frequency currents, induces extremely powerful currents, not only on the surface of the body, but as far as the intima of the tissues. A horizontal or

vertical solenoid may be employed of a size which will enable the patient to stand up or lie down.

Apostoli employs two methods: a solenoid without contact or a solenoid in which the patient is in contact by grasping one of the poles in this arrangement. The patient is in monopolar shunt, while at the same time he is submitted to auto-conduction.

In the beginning of the seance, or immediately after, some patients will complain of headache, with inability to read, vertigo, and nausea, accompanied by immediate and rapid malaise. After a few hours this reaction may be followed by fatigue and extreme lassitude, with a return of old pain which appeared to have been suppressed. According to Apostoli, this reaction, if existing, attains its maximum intensity in the solenoid without contact, being less for the cage with contact.

The hysterical anesthetic presents these reactions most particularly. In the majority of cases, however, this mode of application rarely provokes so accentuated reactions. In senile rheumatics, certain diabetic, the anemic or chloro-anemic, the reaction may run from a simple sensation of lassitude to an impression of overwork.

Denoyes found that no sensation other than a slight prickling or feeling of heat either during or after the treatment was experienced in some cases. At the end of the treatment some complained of the above symptoms to a mild degree. Apostoli studied this phenomena very carefully, and concluded that where such reaction appeared it constitutes a contraindication for the use of auto-conduction.

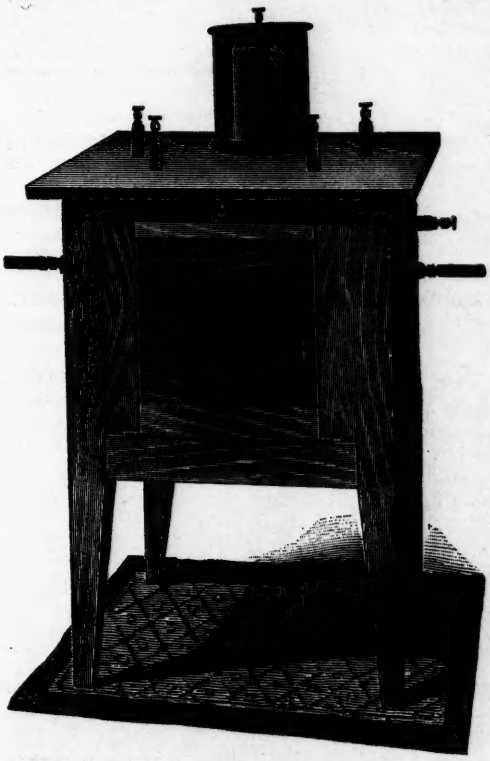
These reactions may be provoked in the beginning, gradually weakening, and finally disappearing as treatment continues. In others it may not appear till after the second or third seance, especially as they are prolonged. Finally a brisk increase of the regular durations of seances causes appearance of troubles which up to that time may never have been manifest.

It would appear from these different reactions that some precautions should be taken in the application of auto-conduction. It is always well to begin with short seances, two or three minutes, progressively increased. This obviates disagreeable and discouraging first impressions.

CONDENSATION.

This method consists in placing the patient so that he constitutes one of the armatures of a condensor. Upon a couch or sofa is placed a sheet of lead, tin, or zinc, attached to one of the extremities of the solenoid. Over this is laid a mattress of insulating material upon which the patient reclines. Fixed in movable contacts attached to the other pole of the solenoid in an intermediate point are grasped by the patient. The whole of the system constitutes a condensor. The patient represents one of the two armatures, the metallic plate by the other, the mattress forming the dielectric. By this system a current of as much as 300 milliamperes can be made to pass through the patient. At each oscillation, in fact, the condensor is charged and discharged.

We know that high-frequency currents circulate perfectly in open circuits since the least capacity enters in play. However feeble may be the capacity, the charge and discharge is repeated hundreds of times per second under a raised potential constituting a notably mean current. One also can observe the passage of a current or the production of sparks when one approaches or touches a single point of the solenoid. In this case the body constitutes an insulated surface which is charged at each oscillation of an almost constant quantity, and which is at a certain distance from



the solenoid. The corresponding charge of a contrary sign should be found upon the parts of the spiral which are at this moment of a different potential.

Reaction Provoked by the Method.—The patient submitted to the application generally experiences only slight trembling in the hands at the immediate point of contact with the current. This sensation, according to Apostoli, is always well borne and must never go so far as to cause pain. It is easy to establish the fact, however, that the subject placed upon the *lit condensateur* is really electricized. If one lightly touches the skin with the finger ends, he can perceive small painless sparks. If one approaches the hand to the patient's head without breaking the sparks, there is often experienced a sensation difficult to explain,

and which can be spoken of as a heavy head. Apostoli stated that intolerance is manifested for most patients to a lesser degree under condensation than under the large solenoid. Denoyes finds, however, in senile rheumatics, certain neurasthenics, vertin diabetics, anemics, and chloroanemics, that the *lit condensateur* is more fatiguing than the cage. The intensity of the current to which the patient is submitted varies with the regulation of the producing apparatus.

It is not possible in so short an article to furnish a formula of the indications of high-frequency currents because of the diversity of their methods of use and the extent of their field of application. It can be said, in conclusion, however, that they have been employed and given excellent results in diseases due to lowered nutrition, affections respiratory tract, affections alimentary canal particularly, constipation, hemorrhoids, and anal fissure, neurasthenia and neuritis, articular affections of different origin and in great number of dermatoses.

The only contraindications for high-frequency currents is any valvular disease of the heart, or those suffering from hysteria.

ARTHRITIS DEFORMANS AND ITS TREATMENT.[1]

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THE arthritis deformans of Virchow (1869), which possesses twenty-five or more synonyms, was first correctly recognized as a particular disease by Landré Beauvais in the year 1800. It is a chronic degeneration of the joint cavities, and has a special and distinct symptomatology which for centuries was confounded with gout, with rheumatism, and other infectious diseases of the articular apparatus.

Its etiology is as yet undiscovered. Its pathology consists in mucoid degeneration and disappearance of the central part of the cartilage; erosion and eburnation of the exposed bone; hypertrophy and fatty degeneration of the synovial membrane; newperipheral cartilage growth, and later ossification thereof.[2] A. E. Garrod says there is a fluid effusion, others, that the parts are dry. With these profound changes, fibrous adhesions do not occur, and bony ankylosis only in the disease of the vertebral column. There is secondary atrophy of the voluntary muscles and an anemia, blood abnormal in hemoglobin and red blood corpuscles.

The disease may seize upon the joints of the upper and lower extremities, with or without involvement of the vertebral column and of the temporomaxillary articulation. Its invasion is centripetal and symmetrical (this is the polyarticular or multiple form).

In both sexes and at all ages except infancy, it is five times more common in women than in men. Most cases develop between forty and fifty years, either as an acute inflammatory outburst or insidiously with pain and stiffness most felt at night and in the morning. It is the most frequent acute or chronic disease of the joint system, and much oftener encountered than articular rheumatism, gout and the several joint infections combined. Multiple arthritis deformans is so common in middle-aged and elderly females that the theory of it being a senile change is at least plausible.

The disease has acute exacerbations simulating mild articular rheumatism with slight febrile temperature. There is constant complaint of pain, articular, muscular and neuralgic; of stiffness of motility, tenderness of the joints. The swollen joints stand out more prominently, because of the wasted muscles.

This fixation of the joints may, by natural progression be temporary or permanent, limited to the knees or vertebral column, or so general that the helpless victim, with mummy-like rigidity, cannot even use the jaw in mastication. There is no spontaneous recovery, and the afflicted live for years. The termination of the disease in its natural course is rude and truly deforming.

The monarticular or senile form affects the vertebral column most disastrously as spondylitis deformans, more common in men; malum coxæ senile, in both sexes. Occasionally it also affects a shoulder, elbow or knee. That these varieties all belong to the same affection as the polyarticular is proven by the fact that all have symptoms present in common, which must always be considered for correct diagnosis, to wit: (1) Heberden's nodes of the phalangeal joints of the fingers; (2) numbness and tingling of the hands and forearms; (3) crepitation of the knee-joints, especially of the left side. This is produced by pressure on the patella with rapid flexion and extension of the leg; (4) a pulse of 100 or more beats per minute. Heberden's nodes and knee crepitus are found in every case of arthritis deformans.

The indications for treatment of this extraordinary malady in our present imperfect knowledge of the same is comprised in the following summary: (1) Relief from pain; (2) correct the stiffness and rigidity of the affected joints and muscular contractures; (3) increase the muscular strength; (4) cure the anemia; (5) increase, where necessary, the body weight; (6) symptomatically regulate or slow the pulse.

To fulfil these indications three agencies are necessary, and so indispensable is each one that no two alone will suffice to achieve good results. They are (1) for pain, anemia, the rapid pulse and malnutrition—arsenic; (2) for stiffness, contracture and muscular atrophy: voluntary exercise; and (3) for weakness, anemia, loss of weight and the pain, greater nutrition brought about by increasing and selecting the food supply.

Arsenic was recommended by Bardsley in 1839, and has been approved by Fuller and Balfour, by Strümpell and others.

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1 Read at the Annual Meeting of the American Therapeutic Society, New York City, June 4, 1904.

2 Archibald E. Garrod. Arthritis Deformans, Twentieth Century Practice, Vol. ii. Alfred Pribram. Nothnagel; Specielle Pathologie und Therapie, Band 7, 5. Theil.

Success with arsenic depends on the method, manner and length of time. It should be used a year or more. It must be so administered that mild arsenical poisoning does not occur, namely, edema, headache, nausea, vomiting and diarrhea. In using arsenic, arthritis deformans may be divided into the mild form, the common polyarticular one, where the chief symptoms are stiffness and pain of no great intensity, and the severe or monarticular variety: spondylitis deformans, malum coxæ senile and all cases where the patient is helpless and bedridden.

For the mild type, one or two drops of the liquor potassii arsenitis U.S.P. after meals thrice a day may be used for a very long time, with very satisfactory results. The pains, whether muscular, articular or neuralgic, disappear after a month or two. When this has been achieved, the treatment must continue with unremitting regularity.

Arsenite of zinc may be used instead of Fowler's solution. The dose is one-twelfth of a grain in the form of a pill, repeated twice a day. In the severe forms the arsenic is used in hypodermic injection, as by the mouth the effects are too slow and uncertain. The risk in loss of time is too great a venture. An injection should be made in the lateral gluteal region every third or fifth day. In 60 minims of boiled water are dissolved three-eighths of a grain of sodium arsenite and 1½ grains of sodium of chloride. This solution is painless, unirritating and never causes abscess. As in the former form of medication, these injections should be continued for a year.

Mechanical treatment of the active kind is best in all cases. The patient must be encouraged to help himself. Passive exercise is demoralizing because it produces apathy and engenders an expectation of improvement that does not come.

The principle to be impressed upon the minds of the afflicted is that rest for a limb is harmful. Rest in bed aggravates the disease by favoring immobility of the joints. Daily exercise is beneficial, though productive for a time of pain and discomfort. Daily walks and rides, household and other manual occupations are necessary in the mild forms. For the severe and advanced stages, the use of dumb-bells and calisthenic exercises to give strength and vigor to the upper extremities; daily locomotion with regulated and increasing distances for the lower limbs. Where there is much impairment of function in knee or hip, this exercise must for a long time depend on the aid of crutches or stout walking cane.

A valuable means of restoring the power of locomotion when abolished through partial anchylosis and muscular atrophy is the daily use of the pedals of an ordinary bicycle secured to the top of a short upright bar or post. It rests upon an appropriate stand or pedestal. The patient seated upon a chair or astride a trestle, can, by making the pedals revolve with his feet do much to accomplish improvements and cure. In many cases the radius of excursion in the patient's limbs is so restricted that in the beginning it will be necessary to secure the pedals nearer to the central axis than is found in the contrivance employed. The shafts therefore are perforated with holes at regular intervals into which the pedals when screwed make the rotations larger or smaller. At first also it may be necessary to secure the subject's feet with straps to prevent them from slipping, or else to hold them by hand until sufficient voluntary control of motion is acquired. By keeping a record of the number of revolutions to the point of muscular exhaustion the very great benefit derived from this exercise will be made apparent to the victim of the disease. Starting with twenty-five or fifty small and painful turns a day, in a month or so two thousand easy rotations are made. In fact, the speed and strength reached may surpass the powers possessed by one in health.

The dietetic treatment is of great importance. Improvement cannot occur without it. There is in arthritis deformans, loss of weight, muscular atrophy and anemia. To counteract these, food consumption is the best of means.

The diet should be varied, liberal and mixed, consisting in the daily use of meats, fowl, game, fish, eggs and all varieties of vegetable food. The patient's appetite must be tempted and whetted by gastronomic and culinary art. In addition to three regular meals a day, the consumption of three or four pints of milk at other hours, and at night, is the best of means for improving strength and weight.

Dessert is forbidden, and fruit particularly does harm, with the solitary exception of the watermelon. Alcoholic drink, malt liquors, wines, and the stronger spirits should not be allowed. An intestinal irritation, with palling of the appetite is the objectionable feature of fruit eating; a gastritis or hypernemia of the stomach the reason for not allowing strong drink.

With these restrictions the patient is encouraged to enjoy the pleasures of the table, and he should be impressed with the maxim that poor man's gout can be cured only with the rich man's board.

Concerning the beneficial effects of nutritious and varied food in arthritis deformans, there is no question in the minds of those who have of recent time engaged themselves in the treatment of the disease, and it is a remarkable fact when one recalls that so able an observer as Jonathan Hutchinson has considered its etiology as hereditary gout in the female sex.

Local applications are of temporary value and purely anodyne. The oil of wintergreen or salicylic acid thus used may receive a moment's praise from the patient.

A much better application than either, and probably the best of its class, is the emplastrum hydrargyri United States Pharmacopœia, whose action on both local pain and stiffness is marked. In the disease of the vertebral column and sacroiliac and sacrococcygeal articulations its benefit is decided. It may be freely used, as toxic symptoms of murcurialism do not occur.

Of other treatments than that here described the writer has seen no good results and sometimes evil ones. The hot-air treatment, general and local, electricity, galvanic, faradic and static, electric light bath, poultices, hot-sand bath, mud bath, hot bath, cold bath; ice frictions, Roentgen rays, massage, all of these do not cure arthritis deformans, and entail expense, inconvenience and loss of time without compensatory benefit. Ocean voyages, various health resorts and mineral springs—arsenical; iron, sulphur, saline and alkaline—are so restricted in their usefulness, when we consider the immense number of the victims of this disease in the world, that to hold such resorts a means of cure looks pitiful.

Our remedies for the treatment of articular rheumatism, and gout, do harm when given in arthritis deformans. They do not mitigate the pain; they do so diminish the patient's digestion, weight, and strength so speedily that he grows more helpless. This applies to the salicylate salts and the oil of wintergreen, to lithium, the iodides, colchicum and various coal-tar products.

The syrup of ferrous iodide, recommended by A. E. Garrod, may possess some virtue, but cannot be compared to arsenic when used as here given. Good authorities praise elementary iodine, and also sulphur, but both are feeble props in aiding those who have this disease.

With the means here described arthritis deformans can often be cured; and at times the results are rapid and brilliant. The gloomy prognosis which overhangs the staid and erudite descriptions in our medical literature is founded only on the natural termination of a disease process which has run its course, unopposed by appropriate treatment.

PARATYPHOID; A CASE OF THE HEMORRHAGIC VARIETY.*

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IN Philadelphia we have typhoid, like the poor, always with us. By the same token this wealth of clinical material ought to be the means of enlarging our understanding of the disease. Its manifestations are not always sure to follow the typical course, and here, as elsewhere, instances of what might be termed paratyphoid, occur.

The hemorraghic form of typhoid fever is the result of Eberthian infection. The disease will follow a fairly ordinary clinical course, with the exception that the fever, while undergoing the diurnal elevation and morning fall, may show less temperature, or a more variable range of it, somewhat of the appearance of what is noted in the general reaction accompanying slight local suppurative processes.

It is known, indeed, that the specific microorganism is recoverable[1] from the rose spots and from most of the viscera, as well as from the functional secretions and excretions of the body, in the usual form of typhoid.

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In the hemorrhagic variety, however, during the late second or early third week, sudden and severe, at times, perhaps, insignificant hemorrhages occur from one or many of the special mucous membranes, *e.g.*, the nasal, conjunctival, tympanic, oral, pharyngeal, urethral, vaginal or rectal. The skin may offer a sort of hemic leakage, as noted by Samohrd in three cases.

A particular, local Eberthian infection is the cause of this; for in the hemic discharges, as well as in the tissues firstly concerned, the *Bacillus of Eberth* is freely found, and no evidences of secondary septicemia have been reported.

In the five cases of this hemorrhagic variety of the disease, reported by Samohrd,[2] it was a case of the lightest sort which alone proved fatal. There had been a certain tendency to cutaneous hemorrhage and slight urethral leakage, but the general effects were pronouncedly sthenic.

April 15, 1904, I was called in to the following:

Case.—Miss Emma B. aged twenty-four years. Had been suffering from headache, gastric irritability, constipation, cough, and malaise for two weeks. This day was third of menstruation at proper time, though as usual scanty and painful. History of menstruation begun at fifteen; had had usual diseases of childhood, but no previous attack of typhoid. On examination the viscera appeared in normal relations, except the spleen, which was enlarged from 1.0 cm. to 2.5 cm. in each direction; palpable and tender. Tenderness in right iliac fossa. The spleen continued to be a decided source of annoyance for the next four weeks. At the first, there appeared some bronchial irritation, which did not continue into the next week. Temperature first noted at noon was 38.6° C.

Typical typhoid facies; the patient put to bed at once on suspicion, and cold sponging resorted to, with the administration of dil. hydrochloric acid and salol. For two weeks the fever continued, with a daily range of 37.9° C. to 38.8° C., and higher; at the beginning of the attack 39.6° C. being reached. May 4, the Widal still negative. May 1, there occurred a profuse vaginal discharge of blood, which was not mentioned to me until it had continued, with intermissions, for three days. The girl's mother had thought it possibly a return of the menstrual flow.

The discharge, however, was brighter in color and of a rather different nature. Menstruation had occurred at the proper time two weeks previously. This extraordinary hemic leakage returned off and on during five days. May 3, the temperature in the morning was normal; at 7 P.M. 37.5° C., May 5, the usual subnormal morning record appeared. The typhoid facies no longer was noted, and the Eberthian infection apparently had been subdued. Treatment continued with cold sponging, and dil. hydrochloric acid. But the salol was exchanged for protonuclein. Splenic enlargement and tenderness remained a prominent feature. The patient seemed much exhausted by the disease, more so than in

proportion to the amount of fever, which latterly had been moderate, I think, due to the cold water treatment. The appearance of the patient was asthenic rather than sthenic, after the second week. Light diet was ordered on May 13. A recurrence of slight temperature the next day, and a hint of duskiness in the face, warned us that it was too soon. Milk diet was again ordered. The bowels required daily enemas, from the first week. Finally, on May 18, an increase of diet was accomplished, and from then on the return of health has been assured. The Widal was positive when applied May 16. No further vaginal hemic leakage has since been noted.

This is one of a great number of cases of enteric fever I have seen showing very moderate temperature range. In regions where typhoid infection is prevalent it may be possible that many cases of Eberthian infection are so atypical as to escape diagnosis. The clinical progress of the case, however, ought to cause its proper recognition.

One fever case, which I had in March, gave a negative Widal, but showed unmistakable typhoid symptoms, notwithstanding a temperature range that never passed above 38.0° C. It was impossible in this case to resume solid diet until five weeks following the initial febrile stage, although the attempt was twice made and given up on account of immediate return of temperature, which had been subnormal.

As to the pathology of the hemorrhagic form of Eberthian disease there is obscurity of opinion. Clinical study will be in advance of an exact determination of the facts. Some reaction probably does occur in the parenchyma of the mucous structures of the body other than the mucosa intestinalis.

Samohrd suggests the possibility of a "more than commonly virulent species of the specific micro-organism." This, attacking the walls of the smaller blood vessels, would predispose to hemorrhage through the degenerated areas in their continuity. Very few comments on the etiology can be found in the literature of this subject. I have thought it possible that in the cycle of development of the bacillus the elimination of toxins could be different in degree or kind. The individual's reaction may be modified according to idiosyncrasy.

1 Tyson, Practice of Medicine.
2 Sbornik Klinicky, Tomo V, fasc. 1, 1903, and abstracted in Il Policlinico, Rome, No. 21, 1904.

Diphtheritic Paralysis and Antitoxin.—The cases reported by other observers and those that were under his own care, led J. COMBY (*Arch. de Méd. des Enfants*, July, 1904) to advocate the use of diphtheritic antitoxin in the case of all children affected with diphtheritic paralysis, whether or not they have been treated with this for the original disease. In the first place, there is no risk. In the second place, one is not certain that the original infection has entirely exhausted its virulence. The beneficial and quiet results obtained in arresting the progress of cases of diphtheritic paralysis and effecting a cure in three to ten days form ample justification for the above treatment.

INTESTINAL OBSTRUCTION FOLLOWING APPENDICITIS OPERATIONS. REPORT OF EIGHTY-SIX CASES.

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(Continued from Page 406.)

THE LITERATURE AND UNPUBLISHED CASES.

In a paper published by Dr. Lucius W. Hotchkiss (*Annals of Surgery*, November, 1901), there are reported all the cases appearing in the records of the Transactions of the New York Surgical Society since 1893. In this series there were fifteen recoveries and six deaths. Dr. Ellsworth Eliot, Jr., in the MEDICAL NEWS of September 26, 1903, reports three cases, two recoveries and one death. At a meeting of the New York Surgical Society held December 9, 1903, three cases were reported. One by Dr. Hotchkiss followed several weeks after the appendicectomy, in which there was also a small abscess. In the successful operation for obstruction, an abscess was opened in the pelvis. This abscess had caused adhesions, which themselves had produced an angulation in the gut. Dr. Brewer reported a second successful case following a year after the original operation, the obstruction having lasted one week, where seven inches above the cecum a band had caused a kinking of the intestines. The third successful case was operated upon by Dr. Willy Meyer, eleven days after the original operation. In the second operation nothing was done but the opening of a secondary abscess. The adhesions about this abscess or possibly the pressure of the abscess had caused a kinking of the intestines.

Dr. R. H. Follis, Jr. (*Johns Hopkins Hospital Bulletin*, 1903, XIV, 86-88), reports operating for appendicitis abscess. After three days obstruction developed, for which he performed an intestinal fistula. Patient did well for eighteen days, when a second obstruction developed, due to occlusion of another loop proximal to the site of the loop first opened. For this likewise a second fecal fistula was made. Normal bowel-movements were soon established and the two artificial ani eventually closed of themselves.

L. Bérard (*Bull. Med.*, Paris, 1902, XVI., 286-288) successfully operated on a case of obstruction seven years after an undoubted case of appendicitis, where he found many adhesions and a complex volvulus.

Otto Meyer, of Hamburg, reports in the *Deutsche Praxis* (München, 1901, X., 412-414) operating upon an appendix abscess. A more or less general peritonitis ensued, resulting in what were thought to be a number of localized abscesses. Intestinal obstruction set in two weeks after the first operation, and on account of the patient's serious condition, operation was not performed. In its place a needle was inserted into the dilated intestines six times in thirty-six hours, each time with relief of the obstruction. No operation was done and the patient made a perfect recovery.

A. M. Cartledge (Louisville monthly *Journal of Medicine and Surgery*, 1900, VII, pp. 1-4) publishes a case illustrative of a different type than the preceding. Two days following the opening of an appendix abscess, he had to make an artificial anus for intestinal obstruction. Three months later he operated to relieve this obstruction, and found the difficulty to be due to contracted adhesions which had narrowed the lumen to the size of a lead pencil. In the discussion which followed the reading of this paper, Dr. W. C. Duncan said that he had had six cases of obstruction following within a few days after appendicitis operations. In all these he had made fecal fistulæ. Four out of the six died.

Broca writes a very interesting article, reporting six cases, in the *Gaz. hebd. de Med. et Chir.*, 1901, XLVIII., 445-450. He divides the cases into two classes: First, those cases of appendicitis which develop obstruction before the original wound has healed—"early" obstruction; second, "tardy" obstruction; this suddenly appears after a period of perfect health of varying duration, in a person who has already had an appendicitis, either suppurative or non-suppurative, previously operated upon or not. He cites three cases in each class, and comes to the conclusion that different operative measures are necessary in each class.

First class cases: Appendix abscess opened July 4, 1896, appendix not removed. Six weeks later obstruction preceded by progressive constipation lasting four days; operated upon by median incision. Adherent band divided. No relief. Death followed. Autopsy revealed mass of adherent intestines, matted together, in the pelvis. Second case almost a counterpart of the preceding. Localized abscess opened December 9, 1899; appendix not removed. Fifteen days later gradually increasing obstruction. Operation by median laparotomy showed multiple kinkings in an adherent mass of intestines. Death. Autopsy in addition showed a small secondary abscess. In the third case a different method of procedure was employed. On February 6, 1900, an appendix abscess was opened, appendix not removed. Six weeks later obstruction developed. Median wound not made, but the original wound was enlarged. Two openings were made in two adherent coils of intestines, but nothing but gas came out. Adhesions internally carefully separated and a band of omentum found to constrict intestines. Feces then came through the fistulæ. Recovery. Two months later an attempt to close the fistulæ resulted fatally.

Second class of cases represents "tardy" obstruction, which comes on after a longer or shorter period of perfect health, following complete recovery from an appendicitis. The first case was operated upon in December, 1897, and a chronically inflamed appendix removed. Fecal fistula resulted, but closed spontaneously later. On July 1, 1898, operation for obstruction of three days' duration. Wound was reopened, but nothing was found there. He then made median opening. A loop of small intestine was encountered, twisted into a U-shape by a double band in the mesenteric edge. This latter divided. Obstruction not relieved. Death. Autopsy showed an additional obstruction caused by a twisted loop of small intestine, adherent behind the ascending colon.

The second case was operated on July 25, 1898, for a non-suppurative appendicitis. Quick convalescence. Well until February 19, 1899, when obstruction set in. Operation four days later. Median laparotomy. Band found compressing the ileum at its junction with cecum. Obstruction seemed relieved, but patient died a few hours later of shock. The third patient had had seven years previously a severe attack of appendicitis, which was treated medically and from which he recovered perfectly. July 7, 1900, he was seized very suddenly with all the symptoms of obstruction, for which he was operated on in twenty-four hours. Median laparotomy. Band found attached by one end to the intestine, and by the other to the pelvic wall, causing bending and compression of the loop, the two extremities of which were adherent. Division of the band and separation of the adhesions. A second compressing band was found in the right iliac fossa. Recovery. Broca comes to the conclusion from these cases, that cases belonging to the first category had better not be operated upon by a new median incision, but a distended loop of intestine searched for in the old wound, which, when found, should be opened, thus forming an artificial anus without opening the general peritoneal cavity. Later on, after many of the adhesions had become absorbed, the fistula could be closed, if it had not done so of itself. He thinks that the mortality would be much less by using this plan of procedure. In the "tardy" cases he unreservedly recommends a median incision below the navel.

J. B. Murphy (*Chicago Clinical Review*, 1895, V, 645) reports three cases all recovering after operation: (1) In August, 1895, he opened an appendix abscess, not removing the appendix. Subsequently the patient had several severe attacks of almost complete obstruction, for which he operated in April, 1896. He found the cecum adherent to the abdominal wall. A loop of ileum had become wedged in between the cecum and the abdominal wall, and was consequently much compressed. Recovery. (2) In December, 1894, he drained an appendix abscess. In February, 1895, he removed the appendix, following which the patient had four or five attacks each month of abdominal distention, vomiting, severe constipation, the attacks becoming gradually more severe. In June, 1896, operation disclosed a loop of ileum bound down between the cecum and small intestine, the part of the intestine proximal to the constriction being distended, the distal portion contracted. Recovery. (3) In June, 1895, a patient had a severe attack of appendicitis from which he was in bed four days. Following this he had several other attacks of the same difficulty. In January, 1896, after an attack of complete obstruction, he was operated upon. On separating

a mass of adherent intestines, there was found an almost completely flexed loop. Recovery.

Brunton ("Transaction of the Clinical Society," London, 1893, XXVII, 196) reports a case of obstruction due to narrowing of the lumen, the result of recurring appendicitis. The patient had the first attack in May, 1892, followed by five attacks. The last one was in May, 1893. On September 1, 1893, appendicectomy. Twenty-four days thereafter the patient was operated upon for an obstruction of two days' duration, in which there was fecal vomiting. He found a mass of adhesions producing kinking of a loop. Recovery.

G. Marion (*Gazette des Hôpital*, Paris, 1900, p. 1439) has published an exhaustive article on the subject, reporting five cases with one recovery: *Case I.*—Operation, June, 1900, for an acute appendicitis. In September following, operation for obstruction, preceded for twelve days by obstinate constipation, for four days by total obstruction, and for twenty-four hours by fecal vomiting. Median laparotomy. Small intestine some distance from cecum found much distended. Beyond this point, near cecum, intestine was collapsed. Between these two portions in the right iliac fossa was a mass of adherent small intestine, folded and twisted on each other tightly. Recovery. *Case II.*—Operation, May 1, 1900. Gangrenous appendix with general peritonitis. Thirteen days later symptoms of obstruction. Operation, May 17, 1900.—Original wound opened. All the bowel found adherent, twisted, and compressed with no possibility of their being liberated. Cecum incised. This simply produced emptying of the cecum itself. Incision in a coil of small intestine likewise produced only a limited evacuation of the contents of the immediate neighborhood. Autopsy showed practically the whole extent of the intestines agglutinated. *Case III.*—Operation, March 30, 1900, for appendicitis of two days' duration. April 11. Vaginal puncture for abscess in the cul-de-sac. April 21. Operation for obstruction of three days' standing. Findings—great mass of generally agglutinated intestines. Artificial anus made. Death. Autopsy showed the same unrelievable condition present as on operation. Marion here remarks that in many of these cases with a great mass of adherent bowel involving almost its whole extent, it is most difficult to decipher the exact cause as well as the exact site of the obstruction—it may be produced by tension, by bending, by strangulation, by volvulus, etc. These cases result from a general septic peritonitis, and an artificial anus seems the only resource. Another class of cases shows obstruction to be due to localized adhesions, in illustration of which he cites two operations. *Case IV.*—This patient had had a number of years before an appendicitis, for which there had been no operation. In July, 1900, operation for obstruction of several days' duration. The small intestines were found plastered to the cecum in an almost inextricable mass. Death. *Case V.*—This patient had had three antecedent attacks of appendicitis, the last one a month previously. Obstruction existed for four days. Operation.—In cecal region many dense adhesions. Artificial anus. Death. Autopsy showed in the mass of adherent intestines about the cecum a volvulus absolutely constricting the bowel.

Dr. Samuel Lloyd has had four cases of obstruction occurring at varying intervals after a primary appendicitis operation, none within two weeks thereafter. All recovered after operation. *Case I.*—An intestinal coil was adherent to and wound about another loop so as to produce a constriction and total obstruction. *Case II.*—In this case the omentum, forming part of the abscess-wall, was so tightly wound about a coil as to shut off the fecal circulation. *Case III.*—Gangrenous appendix removed. Three weeks after the primary operation, complete obstruction. Operation disclosed the fact that the adhesions in the wall of the old abscess had loosened up, and through the opening thus caused a loop of intestine had slipped, producing a strangulated hernia. *Case IV.*—Abscess alone opened at the primary operation. At a subsequent operation for obstruction, the appendix was found tightly wound about a coil and very adherent, producing obstruction at this point.

Dr. F. H. Markoe has had the three following unpublished cases: *Case I.*—Male, aged forty years. Operation in 1886 for perityphlitic abscess without removal of the appendix. In September, 1894, operation for obstruction, due to adhesions binding the ileum to the old appendix site. Recovery. *Case II.*—Boy, aged eleven years. Operation for acute suppurative appendicitis, September 14, 1889. One month later operation for obstruction due to adhesions resulted fatally. *Case III.*—Girl, aged thirteen years. Operation for suppurative appendicitis, November 29, 1895. Four days later an operation for obstruction resulted fatally.

Dr. Arthur L. Fisk operated upon a case of gangrenous appendicitis with a general peritonitis. Six days later a secondary abscess was opened. Twenty days after the first operation, acute obstruction. Operation disclosed complete kinks in two different places buried in a mass of adhesions. Recovery.

Dr. J. B. Lee gives me the following case: Interval appendix operation June, 1903. No pus, but a few adhesions found. No drainage. Well until November 14, 1903, when he was seized with abdominal pains and vomiting. Large result from high enema. Obstructive symptoms then gradually developed. November 17, he had had no passage of feces or gas for two days. Fecal vomiting set in and distention. Patient having previously refused operation, consented on November 17. Median incision. A band was found stretching from the mesentery, passing over the ileo-cecal junction which it compressed, attaching itself to the abdominal wall. Behind this band a loop of ileum had wedged itself in. The large intestine was collapsed and the small was much distended. After division of the band, gas passed

onward into the collapsed intestine. Death in two days was apparently due to peritonitis, although the bowels had not acted after the operation.

Dr. L. W. Hotchkiss has operated upon these two unpublished cases: *Case I.*—Male, aged 2½ years. Operation, July 21, 1903, on the fifth day of the attack. Appendix found with gangrenous tip surrounded by a small abscess. A secondary abscess opened behind and above cecum. Operation for obstruction, August 7, 1903. Median incision. Angulation found at the cecum due to adhesions. Recovery. *Case II.*—This is a very interesting case of immediate obstruction. Male, aged twenty years. Operation, November 14, 1903, acute gangrenous appendicitis with abscess and progressive peritonitis. On account of intractable vomiting, advancing sepsis, and no bowel-movement, operation two days after the first operation. Median laparotomy. Some free, dark, foul fluid in peritoneal cavity. A mechanical obstruction was found due to adherent band on right side producing a kink. Recovery from this procedure. Ten days later a second obstruction developed suddenly and was rapidly fatal without operation. In addition both wounds were infected and patient was septic.

Dr. Robert Abbe has had five cases of obstruction following appendix operations. All recovered after operations for the obstructions.

Dr. Joseph A. Blake has kindly given me the following three interesting cases: *Case I.*—M. A., female, aged thirty-one years. Operation for chronic appendicitis five weeks previously (operator unknown); no drainage. Obstruction had lasted five days. Operation disclosed the intestines obstructed in three places by fairly strong bands. Adhesive and purulent peritonitis in lower half of abdomen. Leakage of appendical stump. Death in forty-eight hours from sepsis. *Case II.*—J. T., male, aged thirty-two years. First operation January 8, 1901, for appendical abscess. Appendectomy and drainage (tube). Second operation February 21, 1901. Celiotomy for a secondary abscess, situated just below the liver, imbedded in a mass of adhesions. Drainage. The third operation was on March 26, 1901. Intestinal obstruction found, due to adhesion of loop of small intestine to abdominal wall, and a resulting volvulus. Resection of three inches of bowel and end-to-end union with Murphy button. Death on third day from peritonitis. *Case III.*—This case is one of acute intestinal obstruction due to bands, resulting from attacks of recurrent appendicitis without operation. At the time of operation patient was also suffering from appendicitis in the third day of the attack. C. A., female, aged eighteen years. Operation revealed the appendix acutely inflamed, strictured, and distended, fresh adhesions. A loop of ileum, twelve inches long, found strangulated under a band (adhesion), and gangrenous. Appendectomy; resection of gut; end-to-end union Murphy button. Recovery.

Dr. C. L. Gibson has reported to me this unpublished case: J. H., aged eleven years; operation August 13, 1902, for a first attack of appendicitis of three days' duration. There was a gangrenous appendix and free pus in all parts of the abdomen. Drainage was accomplished by an incision along the outer border of each rectus and a third in the epigastrium. Continuous irrigation was maintained for twenty-four hours. Marked improvement followed the operation, and patient was getting progressively better when on the ninth day vomiting and failure of bowel-movement set in. Operation next day. Cecum was found distended with fluid feces. Source of the obstruction not sought for, an artificial anus being made in the cecum. Temporary improvement, but death next day.

Kocher, in an article on ileus in general (*Mitteil. aus den Grenzgeb. der Med. und Chir.*, 1898, p. 227, Vol. 4), reports two cases of obstruction in patients who had had previously attacks of appendicitis unoperated upon, both due to bands from old adhesions. One patient had symptoms of obstruction for ten days, and gangrenous gut was found. This patient finally recovered, although convalescence was complicated with an abscess. The second case had a firm band binding the intestine so firmly as to completely obstruct its lumen. Recovery.

Dr. George E. Brewer has kindly furnished me with the following two unpublished cases: *Case I.*—L. R., aged thirteen years. Acute appendicitis with abscess fourteen months ago; convalescence delayed by prolonged suppuration. Admitted to Roosevelt Hospital, November 3, 1903. Sickness began five days ago with umbilical pain, vomiting and general weakness. Bowels moved once following enema. No flatus nor movement since. On admission, moderate distention, generalized tenderness; temperature 101° F., pulse 120 and weak. Median incision six inches. Transverse colon collapsed and traced downward to right inguinal region, where a dense band was found passing from appendix stump to pelvic basin, beneath which was found about three inches of ileum. Constricted loop, dark chocolate color. Bowel above this loop distended. Loop freed by division of band, stitched near surface wound, injured intestine guarded by omental reinforcement. Wound closed with drainage. Recovery. *Case II.*—A. B., aged twenty-seven years. Has had six previous laparotomies. One for Cæsarean section, one for acute appendicitis, one for ventral hernia, one for "abscess," and two for intestinal obstruction. Admitted November, 1903. Complained for one month of abdominal pain and slight distention with occasional vomiting. Bowels moved with difficulty. For past six days no movement or flatus. Very tender point to left of umbilicus; continuous vomiting. Temperature, subnormal; pulse, 130 and weak. Ten-inch incision to left of median line. Everything densely adherent. Three points of acute angulation found, one almost completely occluding lumen. Intestine distended above this point, collapse below. Adhesions separated and gut freed. A

long rusty needle found penetrating omentum and transverse colon beneath point of greatest tenderness. Recovery uninterrupted.

Lapeyre, in the French Congress of Surgeons (*Revue de Chir.*, November, 1903, p. 628), reports three patients who had had a number of attacks of appendicitis previously, unoperated upon. All were subsequently operated upon for obstruction, from which one recovered.

Sonnenburg (*Centralblatt für Chir.*, No. 50, 1903, p. 1378) in the proceedings of the Berlin Surgical Society reports ten cases of obstruction. In four cases it followed operations for appendicitis where pus was found, while in six cases obstruction followed operations done in the interval. In none at the time of the second operation for obstruction was there perifonitis present. The mortality is not reported.

Dr. Andrew J. McCosh reports in the "Presbyterian Hospital Reports" three cases of post-operative obstruction. All recovered from the operations for obstruction at his hands, one patient dying six months later, after an operation for obstruction, in a western city.

Dr. John Rogers, Jr., kindly furnishes me with following complicated case: Male, aged nineteen years; operation for appendix abscess September, 1902. After a hearty meal, September 29, 1903, sudden attack of "cramps." The next day he began to vomit, passed some gas, but no feces. The next three days he continued to vomit bilious matter and passed no gas nor feces. Seen by Dr. Rogers on October 3, 1903, for first time, when the only complaint was the vomiting of yellowish-green material. Enemata previously given had resulted in the passing of some foul, fecal-smelling, watery movements. Belly found soft and concave, with no tenderness anywhere. Temperature, 101° F.; pulse, 125. Expectant treatment for two days, in which constipation and vomiting persisted. Operation, October 5, 1903. Median opening. Little or no intestinal distention. Exploration of the appendical region showed a dense fibrous band under which the intestine was tightly constricted. This band started from the ascending colon between it and the ileum, and passed up and back toward the spine, and was about two or three inches long. As it was divided, the upper and inner attachment was found to be the free border of the great omentum. The liberated gut when drawn out showed a transverse line of gangrene about one-quarter of an inch wide. The constricting band was so narrow that it had simply divided the gut transversely like a cord, so that very little trimming of the ends was necessary in order to make an end-to-end union with a Murphy button. The constriction was approximately eighteen inches down from the beginning of the jejunum. Recovery uneventful. Button passed on twenty-fifth day.

The total number of cases reported in this article is eighty-six. Of these fifty-seven recovered after operations for the obstruction, and twenty-nine died, giving 66.3 per cent. of recoveries, and 33.7 per cent. of deaths.

Five cases had more than one attack of post-operative obstruction, viz., Johnson's case (reported New York Surgical Society, April 11, 1900) had three attacks, two operations for obstruction had been required within the year following the original operation for appendicitis, death resulting from a third attempt to relieve an obstruction which had developed in the course of the third year; McWilliams's first case in this article had two attacks with recovery after operations.

Hotchkiss's case had two attacks, the patient dying in the second attack without operation; Brewer's patient had three attacks, with recovery after three operations; McCosh's patient had two attacks, with death after the second operation for obstruction.

From this it is seen that .8 per cent. of those who had survived one attack of obstruction suffered others.

The location of the obstruction was given in fifty of the cases. In every one it was situated in the small intestine. The cause of the obstruction was given in fifty-three cases, and they are as follows: Constrictions by bands in twenty-eight patients, volvuli in ten; kinkings, or angulations, in eleven; and internal hernias in four cases. Gangrenous gut was encountered in five cases, necessitating resection, resulting in three recoveries and two deaths.

A fact to be noted is that obstruction occurred after the interval operation in eight cases. While no attempt was made to tabulate all the cases in the literature occurring in patients who had had no operation for attacks of appendicitis, it may be remarked that in this series there were nine such cases.

The time of the occurrence of the obstruction after the appendicitis, or after the operation for it, is given in fifty-four cases. It may be summarized as follows:

In first week, six cases; in second week, eight cases; in third week, eight cases; in fourth week, three cases; in fifth week, three cases; in sixth week, two cases; in seventh week, one case. From the third month to the twelfth, seven cases; between the first and second years, ten cases; between the second and third years, three cases; between the third and fourth year, one case. One case occurred in the seventh year and one in the eighth year.

In concluding this report of cases, I wish to acknowledge my appreciation of the courtesy and generosity of the various surgeons who have so kindly furnished me with their cases, and to record my thanks to them all, collectively and individually.

It is noteworthy that in the innumerable operations for appendicitis, obstruction occurs so infrequently, and in the future we may expect a still smaller mortality from this complication, due to the earlier recognition of the original disease as well as the early operation for this complication at its inception, before the development of gangrenous bowel or peritonitis.

CONCLUSIONS.

1. The rarity of intestinal obstruction in comparison with the innumerable operations for appendicitis is noteworthy.

2. Obstruction may follow an attack of appendicitis which has not undergone operation. Nine such cases occurred in this series of eighty-six cases, or ten per cent.

3. Obstruction may follow the "interval" operation. Eight cases, or nine per cent., belong to this category.

4. Obstruction is most apt to follow appendicitis with abscess formation. Sixty-nine, or eighty-one per cent., were of this class. Hence the necessity for early operation.

5. Mechanical obstruction may come on within a short time after the appendicitis operation, when the differential diagnosis from that due to peritonitis may present great difficulties. When in doubt, operate, for many patients have undoubtedly died, unoperated upon, with an unrecognized mechanical obstruction (with or without peritonitis) where the erroneous diagnosis was made of simple, uncomplicated peritonitis.

6. Obstruction may occur years after the original attack, or operation (*e.g.*, ten cases occurred in the second year), when it may come on suddenly in perfect health, or preceded by a period with symptoms denoting "partial" (chronic) occlusion, the right interpretation of which symptoms, from a prophylactic standpoint, is of the greatest importance.

7. There may be several attacks of true, mechanical obstruction. In the above series of eighty-six cases, several attacks occurred in five, or .8 per cent., of the fifty-seven patients who survived the first operation for obstruction.

8. Of the eighty-six patients, fifty-seven, or 66.3 per cent., recovered after operations for obstructions. Twenty-nine patients, or 33.7 per cent., died.

9. The small intestine was occluded in all of the fifty cases where it was noted.

10. The cause of the obstruction was given in fifty-three cases as follows: Constrictions by bands in twenty-eight patients; volvuli in ten; kinkings, or angulations, in eleven; and internal hernias in four cases.

11. Gangrenous bowel was encountered in five cases, necessitating resection, resulting in three recoveries and two deaths.

12. We may expect a much smaller death-rate in the future, due to the earlier recognition of the symptoms and their more prompt relief by operation. Fecal vomiting should not be waited for.

13. Prophylaxis consists in operating upon appendicitis before the formation of pus, the use of as little drainage as possible, and the least possible amount of handling of the intestines, at the time of operation.

14. Vigorous abdominal massage with elevation of the hips may avert an impending obstruction. Frequent change in patient's position is likewise recommended.

15. Since the exciting cause is in many cases an attack of acute indigestion, patients should have their diet carefully regulated for from four to six weeks after an attack of appendicitis or after an operation.

50 East Fifty-third Street.

A CASE OF LUDWIG'S ANGINA.[1]

BY C. M. HARRIS, M.D.,
OF PHILADELPHIA.

OUR committee has asked me to report to you some facts relating to a case of Ludwig's angina, which was recently under my care. As the disorder is not common, I have thought best to give you a brief description of it, which I have extracted from standard works on surgery, which, however, devote very little space to the subject.

It is generally defined as a streptococcus infection about the submaxillary gland, and alveolar tissue beneath the mucous membrane of the floor of the mouth and upper portion of the neck. It may arise in a perfectly healthy man after an infectious fever or from trauma. As a result of the infection there is a cellulitis about the submaxillary gland which tends to the formation of a slough rather than pus. This cellulitis is said by one authority to follow the infection of a lymph node over the gland, but as to how this lymph node became infected no explanation is given.

The symptoms are some local discomfort followed in two or four days by swelling and pain. The tongue becomes swollen and painful, opening of the mouth is attended with difficulty. The tissues about the frenum are distended. Pressure causes considerable dysphagia, and there is sometimes great salivation and dyspepsia. Edema of the glottis has occurred with fatal result. In some instances high temperature and symptoms of septicemia or pyemia are present; gangrene is sometimes an accompanying factor.

As to treatment, all authorities recommend early incision, with removal of any gangrenous tissue. This may be followed by applications of carbolic acid. The constitutional treatment is that of septicemia.

As to the case mentioned, it was that of a young man, twenty-two years of age; family history was negative and he had always been generally healthy. On August 25 he went to a public bath and remained in the water for two or three hours. The following day he complained of some pain in the right ear and some swelling in the right submaxillary region. On the second day these symptoms were more pronounced. On the third day I made my first visit and found the patient sitting up, with head inclined backward, face flushed, and with a hard tense swelling in the submaxillary region on the right side and about the base of the tongue. This swelling was unattended by external redness or any apparent heat. The mouth could be partly opened with great difficulty. This revealed a thick coating on the dorsal surface of the tongue and some of the buccal mucous membrane. The anterior portion of the tongue was forced

[1] Read before the Northwest Medical Society, of Philadelphia.

upward, showing edematous swelling about the frenum and floor of the mouth. The orifices of the submaxillary and sublingual glands were quite prominent. The patient stated that the pain was worse than on the preceding two days. The temperature was taken and found to be 100° F. and was not higher at any time during the illness.

On the morning of the fourth day the condition seemed stationary. Twelve hours later the swelling had extended posteriorly beyond the angle of the jaw, and the pain in the ear was almost intolerable. Attempts at aural examination revealed nothing except much swelling of the tissues about the external auditory canal. An opiate was given and the patient passed a comfortable night. The fifth day showed some diminuation of the swelling generally and the tongue began to clear. The ear gave very little pain. By the seventh day the swelling was practically gone, the tongue cleared, and the mouth now capable of being fully opened, presented a nearly normal appearance.

On the ninth day some pus was discharged from the affected ear; the external auditory canal showed considerable swelling and redness, but as my skill as an otologist was quite limited, I have never determined whether the pus was formed in the middle or external ear. After a week the discharge ceased and has not reappeared. Patient has since been in perfect health.

Not being convinced of the necessity of immediate incision in this case, the plan of treatment followed was an expectant one. During the first four days of my attendance one-quarter grain doses of calomel were given hourly for eight to ten hours a day and followed by salines. Desiring to demonstrate the value of a sample package of a quite popular preparation of glycerinated clay, a fresh application of this was made every twelve hours until recovery took place. As previously mentioned, an opiate was given on one occasion to relieve pain in the ear. Subsequent treatment of the aural discharge consisted of syringing with peroxide of hydrogen and an alkaline antiseptic solution.

If we are to give drugs the credit for a cure in this case, I must say I am prejudiced in favor of the calomel, and am inclined to think that lead water and laudanum and ice would have acted quite as well as the glycerinated clay.

I consider the prominent factors in this case to be the obscurity of the cause, and the involvement of the ear and the gratifying result of the conservative treatment. However, owing to certain anatomical and physiological reasons, I have not a doubt that prompt incision would be the safer course in a majority of such cases.

Eye-Strain and Inebriety.—Drunkenness has been added to the already imposing list of maladies which oculists pretend to cure by the relief of eye-strain. The craving for alcohol may be, and often is, a nervous affection, and if the source of the affection is in the eyes, according to the argument of a Chicago oculist at a recent conference in Milwaukee, resort must be had to glasses that cheer and not inebriate.

ENDERMOL, A NEW VEHICLE FOR OINTMENTS.

BY PROF. VIRGIL COBLENTZ, PH.D., PHAR.M., F.C.S., OF NEW YORK.

ENDERMOL, a combination of stearic acid amide and paraffin hydrocarbons, forms an almost white mass of about the consistency of lard, inodorous, of neutral reaction and fusing at 78° to 80° C. The iodine absorption number is 16.98, while that of lard averages about 62, a point in favor of the former as a vehicle for iodine.

When exposed to the air and sunlight under adverse conditions, samples of endermol retained their color, consistency and blandness. When applied to the skin by inunction, endermol forms a smooth, soft, unctuous mass which is readily absorbed. This may be demonstrated comparatively, by applying a little of petrolatum, lanolin and endermol in separate portions, by inunction to the skin and noting the time required for absorption. Furthermore, applications of endermol ointments of iodine (without potassium iodide) and also aconite, were followed by the excretion of iodine in the urine after about five hours in the former, and the characteristic dryness of the throat in the latter.

Rancidity in fats is due to hydrolysis or splitting up of the esters of the fatty acids, with liberation of the free acids. To the presence of these the irritating properties of rancid fats are due. In endermol, consisting chiefly of stearic amide, we have a stable fatty acid derivative which is not decomposed under any conditions through the action of light, air, moisture or such chemicals as are usually employed in ointments.

To demonstrate the adaptability of endermol as a vehicle for ointments, mechanically as well as chemically, such substances as the yellow and red mercuric oxide, yellow and red iodide of mercury, zinc oxide, lead subacetate and carbonete, ichthyol, tar, vegetable extracts and mercury were prepared. All of these yielded smooth, uniform ointments which showed no change whatever upon exposure.

The use of petrolatum, as is well known, is restricted to that of a dressing and this to a limited extent owing to its immiscibility with water, certain chemicals and galenicals.

Lanolin, an excellent vehicle, is objectionable because of its stickiness and toughness and when combined with animal fats (as in lanolin crême), such ointments become rancid and offensive.

There is nothing so objectionable to either the physician or pharmacist as a rancid ointment. While lard or other animal fats may originally have been anhydrous and benzoinated, yet rancidity ensues sooner or later, particularly so when aqueous fluids have been incorporated, as frequently is the case in ointments. Aside from the irritant action, chemical reaction of the liberated fatty acids upon the medicinal agent follows.

Again, lard substitutes consisting of mixtures of suet or tallow or cotton-seed oil stearin, with cotton-seed, sesame or cocoanut oils, are not only open to the same objections, but also the possible

presence of alum, alkalies or water, which render them still less desirable.

Because of its blandness, pliability and freedom from stickiness, endermol is especially adapted as a lubricant for massage treatment, always leaving the skin soft and pliable.

To sum up, the advantages of endermol as an ointment vehicle, are: Absolute freedom from any tendency toward rancidity, although as much as 15 per cent. of water may be incorporated. Ready penetrability and absorption. Pliability, smoothness and fredom from stickiness. Freedom from irritating properties.

A SIMPLE AND ACCURATE METHOD FOR ESTIMATION OF SUGAR IN THE URINE.[1]

BY HARVEY G. BECK, M.D.,
OF BALTIMORE, MD.;
ASSOCIATE PROFESSOR OF CLINICAL MEDICINE, COLLEGE OF PHYSICIANS AND SURGEONS.

THE usual method employed for the estimation of sugar in the urine by means of Fehling's solution is fraught with considerable difficulty and the results obtained are often far from accurate. The length of time required to make an estimation, the possibility of other substances being present in the urine, besides glucose, which will reduce Fehling's solution at the boiling temperature, the difficulty of definitely determining the end-reaction, and the necessity, in case of error, of repeating the entire process are all factors which tend to make this method inexpedient. It is for this reason that the writer has introduced a more simple and practical method which is scientifically accurate and requires much less time.

The equipment consists of (*a*) a beaker; (*b*) four centrifugal tubes graduated at 2 c.c.; (*c*) a pipette of 2 c.c. capacity, graduated into twentieths c.c.; (*d*) a wire tube-holder to support the tubes when placed in the beaker, and (*e*) a centrifuge (which is not absolutely necessary).[2]

Method of Application.—The beaker one-third filled with water, or enough to cover the graduation mark on the tubes when placed into the beaker, is placed over a Bunsen flame. The centrifugal tubes are filled to the graduation mark (2 c.c.) with standard Fehling's solution, which is made according to the following formula:

1. Copper solution
   Cupric sulphate..... 34.64 grams.
   Distilled water..... 500.0 c.c.
2. Alkaline solution
   Sodium and potas. tartrate... 173.0 grams.
   Potassium hydrate..... 125.0 grams.
   Distilled water..... 500.0 c.c.

Mix equal parts of the two solutions.

The tubes are next placed in the tube-holder and transferred into the beaker. They should be numbered 1, 2, 3 and 4 respectively, according to their position in the tube-holder. When the water boils remove the tubes and, by means of the pipette, add the urine in quantities of 1/20 c.c. Begin by adding 4/20 to tube No. 1 and increase the quantity by 1/20 in each successive tube. For example, 4/20 are added to tube No. 1, 5/20 to No. 2, 6/20 to No. 3 and 7/20 to No. 4.

Care must be exercised in adding the urine. In order to measure accurately these small quantities the index finger, which must be dry, is placed over the upper outlet of the pipette to control the discharge of the urine. Before discharging the urine touch the wire of the tube-holder with the tip of the pipette to release the urine which may have collected on the outside of the orifice, then place it in tube No. 1 in such a manner that the tip will touch the side just above the surface of the reagent, and remove by drawing it along the surface of the tube to the top. Proceed in the same manner with the remainder of the tubes. The tubes are next violently shaken in order to thoroughly mix the urine and the reagent, after which they are returned to the beaker and allowed to remain in the boiling water for three minutes. They are then removed and the red cupric oxide is allowed to precipitate by standing, or precipitation is facilitated by centrifugalization. In the latter method due care must be taken that the order of the series of tubes is not disturbed. The color in the tubes is now observed, and if the Fehling's solution in No. 4 is not completely decolorized, 4/20 c.c. of urine is added to each tube, increasing the amounts respectively to 8, 9, 10 and 11-twentieths c.c., again treating them as before. These steps are repeated until complete decolorization is observed. The first tube in the series which is completely decolorized is chosen and 20 divided by the number of twentieths c.c. which have been added to this tube gives the percentage of sugar present.

To illustrate: 2 c.c. Fehling's solution are reduced by .01 grams of sugar; 1 c.c. of urine contains twenty-twentieths (20/20) c.c.

Suppose sixteen-twentieths c.c. of urine reduce 2 c.c. of Fehling's solution, then the number of twentieths c.c. (16) required will have contained .01 grams of sugar.

16 : .01 : : 20 : ×

× = .0125 (the amount in grams of sugar in 20-twentieths or 1 c.c. of urine.

If 1 c.c. of urine contains .0125 grams of sugar, 100 c.c. contains 1.25 grams or 1.25 per cent.

1 : .0125 : : 100 : ×

× = 1.25 per cent.

To determine the end-reaction more definitely 1/20 c.c. of urine is added to each tube after sedimentation in such a manner as to form a thin layer on the surface, after which the tubes are returned to the beaker without agitation. A yellow ring of cuprous oxide appears near the surface in those tubes in which reduction is incomplete.

The above method will suffice for all practical purposes. When, however, a scientifically accurate determination is desired the following measures should be added in case less than 10/20 c.c. of urine is used to reduce the Fehling's solution.

[1] From the Clinical Laboratory of the College of Physicians and Surgeons.

[2] This apparatus can be obtained through Eimer & Amend, of New York, who are authorized manufacturers.

After the steps are carried out as directed above the last tube showing incomplete reduction is noted, and the remaining tubes containing a smaller quantity of urine are brought up to the same amount by the further addition. The urine is now diluted with three volumes of water, and after 1/20 c.c., which represents 1/80 c.c. of urine, is added to No. 1, 2/80 to No. 2, etc., proceed with the test as before. The number of eighthieths c.c. of urine required to complete the reduction are added to the amount already used and the calculation made accordingly. The result will give the exact per cent. of sugar present.

Example.—If the last tube, showing a bluish tint, contains 6/20 c.c. of urine and 3/80 c.c. more are added before the color entirely disappears, the equation is as follows:

$$6/20 + 3/80 + 27/80$$
$$27 : 80 :: .01 : \times$$
$$\times = .0292 +$$
$$1 : .0292 + :: 100 : \times$$
$$\times = 2.92 + \text{ per cent. of sugar.}$$

The following advantages are claimed by the author for this method: (1) The estimation can ordinarily be made in less than ten minutes, which is less than half the time required by the original Fehling's method. (2) With reasonable care the results obtained are decidedly more accurate. (3) By means of the number of tubes, several can be used for control tests; thus one can make two or more determinations at the same time. (4) The solution never reaching the boiling temperature, the possibility of substances appearing in the urine which reduce Fehling's solution at the boiling point, as uric acid, kreatin, kreatinin, nucleoalbumin, etc., is eliminated. (5) The delicacy of the test is not impaired by removing some of the solution for the purpose of determining the end-reaction. (6) In the event too much urine is added to one tube the estimation can be carried out in the other tubes, thereby obviating the necessity of repeating the whole process.

PRESENT-DAY TREATMENT OF TUBERCULOSIS.[1]

BY J. W. KIME, M.D.,
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SUPERINTENDENT OF BOULDER LODGE SANATORIUM FOR TUBERCULOSIS.

WHEN a diagnosis of tuberculosis has been made the question of treatment at once presents itself, "What shall be done with the patient?" Almost without a dissenting voice, either from physician or laity, comes the answer, "Change climate at once; go to Colorado, Arizona, New Mexico, Southern California, Florida or North Carolina."

Why?

We have here presented the most varied climes, the widest ranges of temperature, the greatest diversity of humidity, and altitudes extending from the sea level to that of the snow-capped mountains in the heart of the continent.

[1] Read before the Iowa State Medical Society, May 20, 1904.

The cases are the same, their circumstances the same and the ability of their advisers the same. Why, then, opinions of so great diversity? It is unusual in the practice of medicine that the experience of one physician is diametrically opposed to that of another of equal ability. Neither is it here. Cases get well in all climates, in all altitudes, in all degrees of humidity and without any regard whatever to the degree of temperature. And, conversely, new cases arise in all climes, in persons who have never changed residence and without any regard to climatic conditions.

A study of the various health resorts States referred to shows the following:

	Altitude.	Barometric Pressure.	Percentage of Sunshine.	Humidity. 8 A.M.	8 P.M.	Mean.	Temperature. Spring.	Summer.	Fall.	Winter.	Average.
Asheville.....	2,250	....	65	.. ..		76	54	71	55	38	55
Denver.....	5,291	24.72	72	61	39	50	47	69	50	31	49
Jacksonville..	43	30.03	59	85	77	81	68	81	70	56	69
Los Angeles...	338	29.62	73	78	64	71	59	68	63	54	61
Phoenix.....	1,108	28.75	84	50	24	37	67	87	69	52	69
Santa Fé.....	7,013	23.27	77	57	36	46	47	66	49	31	48
Des Moines....	861	29.11	59	80	65	72	48	72	50	23	48

The above data have been kindly furnished me by Dr. Geo. M. Chappel, director of the Iowa Weather Service.

Since each of these widely differing climates shows results in a certain percentage of recoveries, and none of them excels to any appreciable extent over others, it is evident that neither temperature, humidity, elevation, atmospheric pressure or percentage of sunshine is the factor to which the favorable change may be accredited.

There is no marked difference in the number of recoveries, whether in Norway, the British Isles, in Germany, France or Italy. Crossing to our own side of the Atlantic we find like results in Massachusetts near the sea level, in the Adirondacks of New York, in Pennsylvania, in the Valley of the Mississippi, in the Rocky Mountain region and in the great Southwest. Equally good results are obtained on the mountain-top or at the sea level, in the dry and arid regions, or on board a vessel in the open sea. As between the invigorating breezes of the North and the depressing heat of the South the former are much to be preferred. In New York or Massachusetts, in Wisconsin or in Iowa patients under proper supervision will do infinitely better, and more of them will get well than if they seek some fabled clime in some far-off land.

The benefits to be derived from a change of climate are nothing to be compared to the hardships sustained, to the wide separation from home and friends and the weary waitings for the return to health. All writers agree that this is not a question of months, but of years, and more recently it is affirmed that the change must be a permanent one. As a result of the extravagant claims of climatologists, some of the sections named have been flooded with poor consumptives, many too sick to be on their feet, with money

gone and friends thousands of miles away. Even for those with means and in fair physical condition it is daily becoming more difficult to find suitable shelter. Few doors are open to them. In Denver and in many other places I find that children, dogs and consumptives are classed together as undesirable tenants. California proposes legislation to keep the consumptive out. In all the sections noted, except possibly Asheville, N. C., there is not a single sanatorium of any size that is open to these patients.

Such a place was promised at Idyllwild, in Southern California, but it has become a pleasure resort, and consumptives are no longer admitted. There are a few tent colonies and some small private institutions, but nothing worthy of comparison with the sanatoria in New England and in the Eastern States, sections not noted for their climatic conditions. None of these health resort States are prepared to care properly for the tuberculous patient, and it is little short of homicide to send him where no preparation has been made for his reception. There is so little in specific climate that it may practically be ignored without detriment to the patient. Were figures necessary to confirm this statement they might be found in your own case records. Of all those sent but few are now alive.

In referring patients to any climate the order is simply, "Go." Not a word of what to do or how to live, of life in the open air all the time, of special diet and forced feeding, of rest and constant medical supervision. All this is left to the patient's own sweet will. And the consumptive patient has no will. Tuberculosis is to a marked degree a species of insanity—insanity in the sense that the mind of such a patient is no longer a normal mind. The toxins secreted so affect the delicate mechanism which has for its function the transformation of the material cell into the intangible and immaterial thing which we call "mind" that the normal flow of cerebration is interrupted, and the patient is controlled by moods and spells that do not characterize his actual self. Yet this patient, sick both in body and in mind, is given rein to drift with every passing whim in any direction that resistance does not present. Little wonder is it indeed that he falls a prey to all the fakes and charlatanry of the day, that all the nostrums are tried and all the cures are taken!

It is unquestioned by all who are qualified to express an opinion, that the physician who advises a change of climate for the cure of tuberculosis does his patient a grave injustice, he reveals his inacquaintance with the modern treatment of the disease and stands at least half a decade behind the onward progress of the profession in which he is enrolled.

Climate in tuberculosis is a will-o'-the-wisp, it is the end of the rainbow with its pot of gold. It is ever just a little beyond. It rests in Colorado, New Mexico, Arizona, California. Like children in their simple faith chasing the rainbow's vanishing end and delving for treasures where once it stood, our patient pursues his phantom till worn and wasted, weary but hopeful still, he falls asleep and wakes to learn that the magic end of the bow of promise rests upon the mystic shores of the spirit land.

It has repeatedly been shown that cure is seldom effected by climate to such an extent that the patient may return to his former home. That is, one cured in Colorado or California must remain in the climate where improvement was effected. All practitioners have noted this fact, and all phthisiologists assert its importance. These patients must be treated as near to their places of residence as may be possible, and fortunately, even the best climate is of secondary importance to methods at our command which are readily obtainable in any suitable locality. In other words, it is everywhere conceded by those in position to know best, that patients sent afar from home to some climatic resort are leaving conditions better suited to their recovery and, with all the added hardships, are not receiving the benefits that might be found near home.

The exaggerated claims for climate in the past have been reduced to the single one that that climate is best which permits the greatest number of hours to be passed in the open air.

In all tuberculosis sanatoria, both in Europe and America, no matter where located, it is found entirely practical to keep patients in the open air not less than twenty hours out of the twenty-four. This is likewise true for Iowa. Little inconvenience is found in the open air method, both day and night, except on the very few days when the mercury ranges far below zero.

The excessively cold weather of January and February of this year will be remembered. For an entire month the mercury scarcely rose to the zero point, while the frost penetrated to a depth of six feet or more into the ground. Yet during all this period, with the exception of a very few days when the lowest points were touched, every patient at Fort Dodge was in the open air both day and night, except at meal times. Not only this, but the patients were perfectly comfortable and contented. Nor do these conditions apply to Iowa alone; they are known to be true for all that vast region extending from Maine to Iowa, and it is difficult to conceive a climate that will permit a greater number of hours to be passed in the open air.

The open-air method may be variously applied during the winter months in our northern climate. Trudeau and Loomis Sanatorium place their patients on open porches well protected from the winds. Many institutions abroad adopt the same measures.

We have found it very convenient to practically convert the patient's room into an open porch by throwing the windows, which are of large dimensions, wide open, while on the opposite side of each room ventilating shafts pass upward through the roof. The patients are kept comfortable by means of clothing, robes, caps, foot-warmers, etc.

So important is the correct expression of the present professional opinion upon this question

that I quote some of the best authorities. Trudeau says: "When I went to the Adirondacks in 1873 the medical profession took little interest in the disease known as consumption, there was no recognized treatment for it except change of climate, and patients were sent principally to warm climates in a desultory sort of way, because they coughed, and nothing that could be done for them at home was of any avail.

"Each medical authority held differing and often very decided views as to the relative advantages of various climates; some advising warmth and equability, others laying special stress on dryness or elevation. Nevertheless little by little it became evident that the great majority of consumptives died wherever they went, and the few recoveries that took place occurred in regions which differed widely as to elevation, temperature and dryness, and that as many patients recovered in the intense cold and storms of the high Alps and other mountains as in the warm, equable temperature and dryness of atmosphere to be found in such countries as Egypt and the south of France, while cures were reported from time to time in patients who had gone on long sea voyages or remained in indifferent climates where none of the conditions considered essential existed.

"Wherever the consumptive was sent by his physician, little or no stress was laid upon regulating the habits of his daily life, beyond a recommendation to live out-of-doors and to exercise as much as possible, while for medication cod-liver oil and, later, creosote were generally prescribed."

I regret to say that in Iowa, as far as this question is concerned, a very large percentage of physicians are still living in the year A.D. 1873.

Knopf says: "There is still a vast diversity of opinion as to the respective merits of what are still sometimes called "specific climates" for consumptives; but the number of phthisio-therapeutists who consider even the best and most suitable climate of secondary importance, and the hygienic and dietetic treatment, preferably in a closed establishment, or under constant medical supervision in congenial surroundings, the all-important factor, is constantly increasing."

Hillier, a well-known English authority, says: "Ocean voyages, high altitudes and dry climates have all been eulogized in turn as remedies for phthisis. I have had phthisical patients under my care and observation for considerable periods of time under all these conditions, and the conclusion I have come to is that the benefit derived in every case is chiefly dependent on the extent to which the patient is constantly kept in pure air."

As long ago as 1897 an Iowa physician, after spending several years in Southern California, New Mexico and Arizona, said: "One hundred men buy lottery tickets, one receives a prize. The ninety-nine have not only received blanks, but they have sustained heavy losses. The successful one's name is heralded to the world and soon all know of his gain. The ninety-nine welcome seclusion. A few itinerant consumptives are perhaps to-day enjoying recovered strength and health, while thousands have sacrificed their only chance of recovery in their mad search in many climes for that which they might have found at home, if their wisdom had been as ardent as their zeal."

Medicines.—The medical history of a case of tuberculosis usually is: (1) A course of patent medicines prescribed by himself, the druggist, or by the patient's friends. (2) A course of medicine under the physician, consisting of creosote, guaiacol, cod-lived oil, maltine, tonics, etc. (3) A course of tuberculin, lymph, copper, or other specific for revenue only. It is difficult to say which of these courses is most harmful to the patient. All lull him into an unsuspecting belief that something is being done, and that he is getting better, while daily his chances for recovery are slipping away from him.

While it is certain that no medicine or lymph or other substance has any known value whatever on the tuberculous process, drugs have a legitimate place in this disease. Intercurrent symptoms arise and occasionally call for treatment. If the cough is excessive, night-sweats severe, diarrhea exhausting, or other like troubles arise, remedies suitable for their relief are indicated. But that permanent relief may come from drugs is an error no less grave than that the principles of Christian Science applied might be fraught with results for good. Time is lost in any attempt to treat these cases with medicines, and time is the essential factor which determines the chances of recovery in this disease.

In this connection I quote from the report of "The Tuberculosis Committee of the Charity Organization Society of the City of New York," a committee composed of many of the best phthisiologists in this country. It says:

"*Resolved,* That a public announcement be made that it is the unanimous opinion of the members of this committee that there exists no specific medicine for the treatment of pulmonary tuberculosis, and that no cure can be expected from any kind of medicine or method except the regularly accepted treatment, which relies mainly upon pure air and nourishing food."

What then shall we do with the consumptive patient?

First, we must recognize him much earlier than has been done by many in the past. It is not unusual to see these patients in almost their final stages without a diagnosis having been made. Practically all such cases die, no matter where they go or what they do. It is exceedingly important that they be recognized in their incipient stages. Time must not be lost in their treatment with medicines. These do no good, while each day the patient approaches nearer to that point when recovery is impossible.

Of all the factors in the treatment of tuberculosis fresh air and sunshine stand first. Trudeau puts it, fresh air and sunshine 50 per cent., nutritious diet 25 per cent., rest 25 per cent.

Medical supervision, constant, painstaking, and with the firmness of military discipline, is necessary to carry out the conditions essential to the proper treatment of this disease. This may be found only in the modern sanatorium for tuberculosis, a full discussion of which time will not now permit.

MEDICAL PROGRESS.

SURGERY.

Ascaridiasis of the Liver and Pancreas.—About one year ago post-mortem observation confirmed the diagnosis of a case of ascaridiasis of the biliary passages and the liver, as well as of the duct of Wirsung and the pancreas, made by O. VIERORDT (*Samml. klinisch. Vorträge*, June, 1904). This was the first instance in which this condition had been diagnosed. The case was that of a two-year-old child, in whom the family and past history had been negative. During the summer the child appeared ill, without any special symptoms except a slight jaundice. After several days of apparent malaise, in the latter part of September, while at the table he began to vomit. The material brought up contained three worms. Following this was a fever of 101.3° to 102.2° F. of three days' duration. After a course of santonin he passed, two days later, per anum, 64 worms, and every day thereafter from 12 to 15 worms. The vomiting occurred on September 27, and three days later there occurred severe abdominal pains. For eight to ten days there was cough, marked emaciation, weakness and complete anorexia. There was absence of fever from the end of September until October 20, when it reappeared. There were four to five daily stools, pulpy, frequently green and slimy. On admission to the hospital on October 22 the child was quite sick. The abdomen was slightly swollen, and the hypochondriac region was tender on pressure. The lower border of the liver in the mammillary line was two finger-breadths below the free border of the ribs. The upper border of the liver was normal and the spleen not distinctly enlarged. The urine showed a faintly positive iron-chloride reaction, and contained neither aceton, albumin nor sugar. There was no leucocytosis or eosinophilia. Examination of the worms passed showed them to be of the genus and species *Ascaris lumbricoides*. A presumptive diagnosis of ascaridiasis of the liver was made. The course of the disease was as follows: A remittent and intermittent fever, with apices at 104° F., without chills or noticeable sweating, and with a gradual fall; considerable pain in the upper part of the abdomen and great restlessness. On October 26, examination of the urine showed a trace of albumin. For two weeks the clinical picture did not change. The right lobe of the liver was distinctly enlarged, hard, sensitive and with a sharp inferior border. A tumor-like enlargement of the edge of the left lobe was indistinctly made out. Under narcosis the spleen was quite palpable. At times, in the left hypochondrium, between the umbilicus and the upper border of the spleen, there was detected a tumor, not sharply circumscribed, round and movable on pressure and then completely disappearing. Worms appeared daily in the stools. The entire clinical picture bespoke with greatest probability ascaris-abscesses of the liver, as well as ascaridiasis of the biliary passages. The movable tumor in the left hypochondrium suggested an ascaris-abscess of the tail of the pancreas. The failure of anthelmintic remedies and the progressive decline, together with the multiplicity of abscesses, made a surgical operation imperative. An incision 7 cm. long was made one finger's-breadth below the free border of the ribs. The upper surface of the liver presented two furuncle-like prominences. The under surface of the left lobe presented a soft, fluctuating spot. The liver was sewed to the edges of the wound. Three days later a second operation was performed and provisional punctures of the liver made. The result of the latter brought only blood, no pus or worms. No further operative procedures were performed. At no time did jaundice appear. Death occurred on November 20 from exhaustion. The autopsy revealed ascarides in the intestine, esophagus and larynx (in the latter probably post-mortal), in the ductus choledochus and in the hepatic ducts, which were enormously dilated and occluded with worms; in the intrahepatic biliary passages, which were also dilated and surrounded by necrotic liver-substance, containing partly a necrotic, pulpy mass, and partly worms. The same conditions prevailed in the pancreas.

Hemoglobin Estimation with Tallqvist Scale.—D. ZUR VERTH and D. SCHUMACHER (*Münch. med. Woch.*, July 26, 1904) have used the Tallqvist scale in all their cases and have controlled the results with the Fleischl instrument. In a hundred cases differences up to 15 per cent. were noticed five times; 10 per cent., 34 times; 5 per cent., 42 times., and no difference, 19 times. The estimation was too high or too low in an equal number. The greatest variation was always noted with blood rich in hemoglobin; in anemia, where the accurate estimation is of most value, fairly constant figures were obtained. The scale is therefore highly recommended in office practice.

Treatment of Post-operative Peritonitis.—In considering instances of peritonitis which develop after operation, E. H. GRANDIN (*Am. Jour. Obst.*, July, 1904) differentiates three types: the *paretic, inflammatory* and *septic*. The first class consists of cases in which, after abdominal section, there is a gradual development of tympanites, the stomach rejects food and drugs, and there is an elevation of pulse and temperature. The treatment recommended is full hypodermic doses of atropine or hyoscine hydrobromate to relax the spasm of the bowel. The *inflammatory* type is characterized by a concomitant rise of temperature, pulse and respiration, three to four days after operation. The bowels may or may not respond, the stomach is usually intolerant to food and medication. Such conditions call for rest, an ice-bag should be placed on the abdomen, the stomach washed out and food administered by rectum. To give rest to the inflamed peritoneal surfaces, codeine is the best drug since it does not paralyze peristalsis or upset the stomach. The *septic* form is characterized by rapid pulse and respiration and *low* temperature. The belly may or may not be tympanitic, the kidneys are inclined to be torpid, the stomach apt to be intolerant and the bowels loose. In this condition a generalized toxemia must be dealt with and a sustaining treatment instituted by the discriminating use of alcohol, strychnine and digitalis. Pus should always be attacked under the recognized rules of surgery.

MEDICINE.

Embolism and Thrombosis of the Mesenteric Vessels.—The typical symptoms of embolism of the superior mesenteric vessels are sudden, very severe, colicky pains in the abdomen, fall of temperature, intestinal hemorrhage, tympanites and exudation into the peritoneal cavity, with signs of peritonitis. K. OSSWALD (*Deutsch. Zeitsch. f. klin. Med.*, Vol. 53) points out, however, that hemorrhages are frequently absent, and that all the

symptoms may point to a paralytic ileus. The cause of the vascular obstruction is usually an embolus in the pulmonary veins, the left heart or the aorta, owing to endocarditis, atheroma or aneurism, but occasionally there is only a local thrombus. The presence of other emboli forms a valuable guide for diagnosis. In the presence of intestinal hemorrhage one must rule out ulcers and portal obstruction, such as occurs in cirrhosis, hepatic syphilis, old adhesions about the porta hepatis, cachexia and marasmus. Where there is intestinal obstruction the differential diagnosis must consider volvulus, invagination and acute peritonitis. The clinical symptoms of embolism of the artery and thrombosis of the vein are exactly alike; the latter condition may be secondary from portal thrombosis, or primary and ascending from the intestines; enteritis, with or without fever, may precede, and varices and hemorrhoids are often present. In the author's case the patient lived only four hours after the artery became obstructed, and at autopsy the vein was also found thrombosed. The cause of the embolus was atheroma of the aorta, of the thrombosis, an enteritis, aided by the arterial occlusion. In a second case the course was more protracted, since many of the smaller peripheral vessels had become obstructed. In treating cases of embolism it is very difficult to decide if an operation is indicated or if the heart's action should be stimulated. The author believes that medical treatment alone should be resorted to as long as there is no intestinal obstruction, but with the latter, an operation alone will save the patient. In doubtful cases, surgical interference should also be considered.

Rare Complications of Dysentery.—The complications of dysentery differ with the two forms, amebic and bacillary. In the former liver abscess is most frequent and perforative peritonitis, profuse intestinal hemorrhage, stenosis of the intestines, pulmonary or cerebral abscess and paraplegia may occur, while in the latter the most frequent complications are inflammation of the joints, tendon-sheaths and serous membranes, and, rarely, parotitis. A patient under the care of B. MARKWALD (*Deutsch. Zeitsch. f. klin. Med.*, Vol. 53) was suffering from the bacillary form and developed a urethritis and double conjunctivitis, with severe iridocyclitis, during the course of his disease. The former manifested itself in pain along the canal, with swollen orifice and slight mucoid secretion. In both secretion of the urethra and the conjunctivæ, bacilli were found, and the patient's blood strongly agglutinated the Shiga type.

Menstrual Jaundice.—A patient under the observation of L. METZGER (*Zeitsch. f. klin. Med.*, Vol. 53) presented all the symptoms of severe liver disease. An operation was postponed, since she was menstruating, and when seen a few days later, the jaundice and other symptoms had disappeared completely. With every menstruation, however, the attack was repeated, so that a close relation between the two could not be denied. The author believes that in some individuals, menstruation is accompanied by a contraction of the biliary passages, which permits the bile to pass into the lymphatics instead of the gall-bladder.

Polymyositis.—The patient observed by W. STRENG (*Zeitsch. f. klin. Med.*, Vol. 53) suffered from severe pains in the muscles of the extremities, with tenderness, a dry dermatitis, edema of the eyelids and of the arms and swelling of the mucous membrane of the mouth. The patient was first treated for rheumatism, but when the inflammation became worse and extended to nearly every muscle of the body, a piece was excised for microscopical examination. The muscle fibers were almost entirely destroyed, and the interstitial connective tissue presented a marked proliferation of round cells. The patient soon developed paralysis of the muscles of deglutition and died of pneumonia. At autopsy almost all the muscles, including the diaphragm, were affected. Not all cases are fatal; indeed, the author believes that many patients are wrongly treated for muscular rheumatism.

Theocin Poisoning.—Theocin has such pronounced diuretic properties, that it is coming more and more into favor, especially in cardiac cases with edema. In a series of cases, E. ALLARD (*Deutsch. Arch. f. klin. Med.*, Vol. 80, Nos. 5 and 6) has, however, observed very severe epileptiform convulsions which were directly responsible for death. At autopsy, the mucous membrane of the stomach was ulcerated and infiltrated with blood, though the dose employed had not been excessive. Experiments with animals then convinced the author that lesions of the stomach are a common consequence of medicinal doses, hence great caution should be exercised. Many of the organs also gave evidence of cloudy swelling.

Fibrinous Bronchitis.—In order to determine the nature of the coagula coughed up in fibrinous bronchitis, the chemical analysis gives better results than the microscopical, but where insufficient material is at hand, it should always be hardened and stained. G. LIEBERMEISTER (*Deutsch. Arch. f. klin. Med.*, Vol. 80, Nos. 5 and 6) uses the thionin and mucicarmine stains to identify mucus, and Kockel's method for fibrin, since Weigert's is less liable where both fibrin and mucous are together. In the majority of cases of fibrinous bronchitis examined, the clots consisted chiefly of fibrin, but in 7 out of 13, mucin was also present. Curshmann's spirals were only found once, and the hunt for Charcot-Leyden crystals and eosinophile cells was always negative.

Cheyne-Stokes Breathing in Diabetes.—A characteristic large type of breathing has been described as typical for diabetes mellitus, and sometimes it is possible to diagnose the approach of coma, since this breathing may precede the latter for several hours, though the subjective complaints of the patients may be slight. W. EBSTEIN (*Deutsch. Arch. f. klin. Med.*, Vol. 50, Nos. 5 and 6) cites several cases where the coma was not accompanied by Kussmaul's breathing, but by a typical Cheyne-Stokes or an irregular type. He has also seen cases of chronic nephritis with the diabetic type of respiration, and argues that both forms are closely allied and probably have the same physiological cause.

Bence-Jones Albuminuria.—According to the latest views, Bence-Jones bodies occur in the urine exclusively in multiple tumors of the skeleton. They need not necessarily be myelomata, but may belong to the class of sarcomata, lymphosarcomata, chondrosarcomata or endotheliomata. A few cases are on record where a clinical diagnosis of the osteomalacia was made, but a microscopical examination always disclosed a tumor. F. VOIT and H. SALVEND (*Münch. med. Woch.*, July 19, 1904) describe in detail the urinary examination of their patient, who gave no symptoms of bone-affection. The urine was atypical in that a precipitate only formed on cooling a sample that had been boiled with acetic acid. On again heating, the precipitate dissolved, to reprecipitate on cooling. A quantitative estimation was possible after the addition of acetate of iron, ammonium sulphate or alcohol. The freshly-precipitated body was readily soluble in water, but lost this property if permitted to stand under alcohol for some time. The urine was also peculiar in that it showed very little tendency to decompose, but after three or four days the albumin began to separate out. The solubility and precipitation can be modified considerably by altering the proportion of salts

in the urine or by adding acid. Frequently another proteid accompanies the Bence-Jones albumin, which seems to belong more to the globulins. The origin of these bodies is still obscure; it is not likely that they are formed within the tumors themselves, as they are often excreted in too large amounts. By giving the patients more albumin, a larger quantity will also appear in the urine, hence the tumor-cells probably in some way attack and modify the circulating proteid. Another interesting contribution to the subject of bone-tumors is contained in the article of S. JELLINEK (*Virchow's Archiv*, Vol. 177, No. 1). Although the patient has sustained many pathological fractures during life, and his skeleton was literally riddled with tumors, Bence-Jones bodies could never be found in the urine. Microscopically the tumors were myelomata.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

Reaction of Protoplasms of Chemotaxis.—This paper is the eighty-sixth report of the Scientific Grants Committee of the British Medical Association. It is interesting to note that presumably on account of the activity of the antivivisection powers in England, the research student J. O. WAKELIN BARRATT publishes as a report (*Brit. Med. Jour.*, June 18, 1904) from the physiological Institute at Göttingen. His summary is as follows: (1) Exposure of *Paramœcia* to acids or alkalies of concentration sufficient to kill in twenty to thirty minutes does not affect the staining reaction of the organisms; (2) prolonged exposure of *Paramœcia* to acids or alkalies of higher concentration causes the well known appearance of "accentuation of basic and acid staining," respectively, but this is a change affecting the protoplasm after death, and therefore of a different order from that occurring in relation to chemiotactic phenomena; (3) *Paramœcia* killed by the constant current resémble *Paramœcia* killed by acids and alkalies of minimum lethal concentration in respect of the absence of any alteration of staining reaction; (4) the chemical reaction of the protoplasm of *Paramœcia* cannot be determined by means of indicators in respect of a concentration of H plus and OH minus ions, which is less than 0.001 N. Within this limit, the protoplasm, living or dead, gives no evidence of acid or alkaline reaction; (5) the protoplasm of *Paramœcia* killed by mineral acids or by alkalies of low concentration gives no evidence of acid or alkaline reaction with methylorange or phenolphthalein; (6) *Paramœcia* killed by the constant current do not exhibit any acid or alkaline reaction.

Infective Element in Gout.—Those who suffer most keenly from certain diseases are not always the most patient and successful observers of the lesion. This is not the case with the English in their studies of gout. CHALMERS WATSON (*Brit. Med. Jour.*, July 16, 1904) presents a series of remarkably interesting microphotographs which illustrate many points on the pathology of gouty tissues. They support the views of Garrod, who, discussing the occurrence of fat in the bone-marrow of gouty individuals, states:

"Although I have not quantitatively determined the amount of fat in the bones of patients who have died from aggravated forms of gout, I am convinced that it often exists in large quantities; whether this is related to the disease or is dependent on imperfect nutrition is not known. It has been held by Ebstein that bone-marrow took an essential part in the development of primary gout—his belief being that the marrow is a site of production of uric acid. The author agrees with Ebstein in his views on the important part played by the bone-marrow in gout, but he goes further in suggesting that it is of no greater importance than the bone-marrow in all infectious diseases. The clinical picture of acute gout is, typically, that of an acute infection; the onset, the chart, the local conditions, the relapses all suggest it. Furthermore the white cells undergo a striking and remarkable change. The interpretation of this change is not clear, but it suggests to the author the existence of infection. Furthermore, the study of gout from a comparative standpoint—it is often seen in fowls—affords ground for a similar belief.

Observations in Sarcoma.—Carefully recorded clinical studies have advanced the subject of sarcoma fully as much, if not more, than laboratory observations. ANDREW J. MCCOSH (*Annals of Surgery*, August, 1904) presents his records of 125 cases of sarcoma. In each one the diagnosis was verified by pathological microscopical study. Twenty-seven of the total number were lost sight of, leaving 98. These were all studied in greater or less detail. Perhaps the most interesting result arrived at by the author is that the greatest number of cases occurred between the ages of thirty and forty years. This, as he says, is by no means in accord with the prevailing idea that sarcoma develops mainly in young adults. He concludes, then, that scarcomata develop in adult life rather than in adolescence.

As to sex, the author's tables show them to be very evenly divided. Of the 98 under observation, 51 have died of metastasis or recurrence, a little over 50 per cent. McCosh discusses the frequency with which a myoma is transformed into a sarcoma, and concludes that this direct metaplasia of the smooth muscle cells into sarçomatous cells is generally recognized.

The average duration of life of the 51 operated patients, who subsequently died, was twenty-five months, the maximum being ninety-six months and the minimum four months. Of the remainder, some are in process of dying, while others are too recently operated on to be counted. This leaves, of the 98 patients, but 39 who have survived the operation for one year or longer. Of the 98 patients, in 56 the operation was complete. Of the remaining 42 incomplete sections one resulted in a cure. Of the 56 complete operations, 14 patients have died of recurrence or metastasis. Of nine lymphosarcomata operated upon, all died—this agreeing with the results of other surgeons. In discussing sarcomata of the lower extremity, McCosh dwells interestingly on Mikulicz's protestation that encapsulated grant-cell sarcomata should be resected instead of amputating the extremity. He holds that while many good results have sprung from resection, he has never seen a case whose interests could be best served by resection. He further discusses the question of amputation and disarticulation, and states that in his opinion the lesser operation is "often preferable and equally safe."

PHYSIOLOGY.

Influence of Ligation of the Extremities on Blood-pressure.—The tying-off of extremities so that the return flow of venous blood is interfered with while the arteries are not compressed, is a procedure which has been employed in pulmonary hemorrhage, since less blood is in circulation, and the general arterial pressure will fall. Esmarch's method is the converse of this; it consists of forcing out the blood of the extremities into the general circulation, and has been used after severe puerperal hemorrhages, though it may be followed by gangrene or pulmonary embolism. W. PLASKUDA (*Deutsch. Arch. f. klin. Med.*, Vol. 80, Nos. 5 and 6) finds that by tying off the extremities by means of a rubber bandage, three-fourths to five-fourths of a liter of blood can be abstracted from the head or trunk. Stasis

in three extremities will diminish the blood-pressure 20 millimeters of mercury (about 14 per cent.). In nervous individuals this is not, however, so constant. Occasionally there will be a sudden drop, with symptoms of collapse, which disappear rapidly if the bandage is removed. If the blood is forced out of the extremities the pressure will rise, but this depends more on nervous than mechanical influences.

The Nature of Chemical and Electrical Stimulation.—Those who are interested in rational pharmacology will find much that is valuable in recent physiological researches in the nature of stimulation. A. P. MATTHEWS (*Am. Jour. of Physiol.*, August 1, 1904), who has done considerable work in the investigation of the relation between ions and physiological phenomena, has conducted a research, the result of which shows that the physiological action of an ion depends upon its electrical state and its electrical stability. He based his experiments upon the well-known fact that the chemical properties of an element vary with its electrical state; thus, iodine in sodium iodide has different chemical properties from iodine itself; nascent (negative) hydrogen reduces, while positive hydrogen oxidizes. Since the chemical nature of a substance depends upon its electrical condition, the conclusion is drawn that its physiological or pharmacological action will also depend on the same factor. As evidence of the truth of this conclusion the following examples are cited: Ferric salts are poisonous to *Fundulus* embryos in concentration, while ferrous salts require a concentration of to kill in the same time, the difference between these salts being the electrical state of the iron. The author's paper adduces further proof of the above proposition and also the fact that not only do the atoms change their actions with their electrical state, but that they act by means of their electrical condition or their electrical charges; and that positively and negatively charged ions have opposite actions. All ions of the same sign act alike, differing in the degree of their action, because the ease with which they change their electrical condition, or give up their charges, varies. This latter factor is measured by the solution tension. The facts of chemical stimulation are summarized as follows: Nearly all electrolytes and non-electrolytes will stimulate the sciatic nerve of the frog in solutions having an osmotic pressure of about 14 atmospheres. This stimulation is not due to the electrical condition of the solution, since it is common to electrolytes as well as to non-electrolytes. It is not due wholly to the extraction of water increasing the concentration of salts in the outside of the nerve and setting up thereby a concentration chain, since the non-electrolytes stimulate nearly or quite as powerfully in such solutions as the electrolytes. This stimulation is probably due to the extraction of water setting up a definite change in the colloids of the nerve rendering the protoplasmic hydrosol unstable. Many electrolytes stimulate in solutions which are so dilute as not to extract water. This stimulation is due to the electrical condition of the solution. All anions have a stimulating action; all cations, a depressing action. This is shown by the facts adduced, as well as by the well-known phenomena of electrical stimulation, in which the opposite electrodes have opposite actions. The ions are minute, freely moving electrodes of different voltages. The physiological action of any ion depends (1) in its concentration; (2) on the sign of its electrical charge; (3) on its electrical stability or ionic potential. Its action is also modified by its velocity and weight; the faster it moves, the more powerful it is; the heavier it is, the less powerful. Physiological action is hence dependent upon the electrical state and stability of the ion and is independent of chemical composition, except as the chemical composition may influence its velocity and weight. Whether any salt stimulates or depresses, depends upon the relative efficiency of its anion and cation. If the anion markedly predominates, as in hydrates, the salt stimulates; if the cation predominates, the salt depresses. Chemical stimulation is thus shown to be electrical and dependent upon the electrical charges of the ions. Electrical stimulation is produced by modifying the distribution of ions in the nerve and thus altering their concentration.

OBSTETRICS AND GYNECOLOGY.

Etiology of Kraurosis Vulvæ.—Certain histological conditions, which are apparently characteristic for this disease, are described by P. JUNG (*Zeitsch. f. Geb. und Gyn.*, Vol. 52, No. 1). These consist of infiltration of small cells, hyperemia, edema, loss of elastic fibers and partial sclerosis of the connective tissue of the corium. In some of these cases there was no symptom of kraurosis and macroscopically no contraction or discoloration of the tissues could be detected. The histological difference between a well-marked case of kraurosis and a chronic vulvitis, is not qualitative, but quantitative, and for this reason the author claims that the disease can no longer be looked upon as an entity, but must be considered as the terminal stage of a chronic vulvitis. The causes which underlie these conditions are: pruritus, chronic vaginal discharge of a specific or non-specific character, diabetes, syphilis, masturbation and neoplasms.

Determination of the Length of Pregnancy.—The many efforts which have been made to determine in advance the day on which the pregnancy in any given case will be terminated and labor begin, have never as yet resulted in anything which can be considered of practical value. F. SCHATZ (*Archiv f. Gyn.*, Vol. 72), has made a special study of this subject and believes that one of the most reliable means is afforded by the periodically recurring pains. In many instances, however, these are not felt and therefore pass unnoticed, but as a substitute the changes in arterial pressure, which run parallel with the menstrual periods, may be observed. The pains generally correspond in their rhythm with the periodic minimum and maximum of the blood pressure. When the maximum blood pressure and the period uterine contractions correspond, the day of expected labor may be quite definitely ascertained. This correspondence also explains what are often designated as early or late births. The number of months remains the same but their individual length varies and this causes an apparent variation in the length of the pregnancy. The author believes that the physiological month exists in reality, and not only in the form of the menstrual period, but is also marked by the recurring pains in pregnancy. It is marked by the variations in arterial pressure and also in other bodily functions.

Primary Hydatid of the Fallopian Tube.—The female pelvic organs are but rarely the localities chosen for the deposition and development of the ova of the *Tænia echinococcus*. They not uncommonly become involved in extensive hydatid growth development in the liver or other abdominal organs, but they are rarely the localities primarily affected. The ovary and the Fallopian tubes are among the last sites in the whole body selected by these parasites. So, for this reason, T. W. EDEN (*Brit. Jour. of Obst.*, July, 1904), reports the following case: Mrs. E., aged forty years, was admitted to the Chelsea Hospital, London, complaining of pain in small of back and in the left side. Menstruation was regular but accompanied by pain during the whole period, in the hypogastric and sacral regions. She had

never been pregnant. Local examination showed a small, tense cyst in the pouch of Douglas, firmly adherent to the surrounding structures and connected by an easily palpated pedicle with the right cornua of the uterus. Dermoid cyst of the right ovary was the diagnosis. During the operation for its removal the cyst ruptured revealing the easily recognizable hydatid vesicles accompanied by lose membrane and a small amount of thin fluid. The tumor mass was carefully removed. No other masses could be discovered in the abdomen and the remaining viscera seemed to be free from hydatid disease. The Fallopian tube measured four inches from the divided end to the abdominal ostium. The inner third was not altered. With the upper border of the outer two-thirds was closely incorporated a cyst of considerable size; the tubal canal was intact, running apparently in the lower wall of the cyst. There was no communication whatever between the tubal canal and the cavity of the cyst. The cyst measured 4½ inches in vertical, 3 inches in transverse, and 2½ inches in antero-posterior diameter. It contained but a single cavity, the inner wall being smooth and polished, the hydatid membrane having been completely detached. The examination of the fluid showed large numbers of typical brood corpuscles, and free hooklets. The patient had lived all her life in London and had never kept a pet dog or cat or any other animal. The ova must have been taken in with some article of food.

The Electrothermic Angiotribe.—The idea of the angiotribe was originally suggested by Baker Brown in 1862. He, however, depended more on the element of heat than upon that of pressure. H. MACNAUGHTON JONES (*Lancet*, July 2, 1904), exhibited the Downes instrument before the meeting of the British Gynecological Society. He stated that Tate and Teith, as well as Byrne and Skene, had all depended more or less upon the application of these two principles for the control of hemorrhage. It was Skene who introduced the practice of electro-hemostasis. The advantages claimed for it are that there is no sloughing of the tissues, that it enables one to act upon a large surface including the lymphatics and opposing an obstacle to the spread of infection. Furthermore, as it leaves no bleeding surface behind it, the formation of adhesions is rendered less likely. Skene with his instrument did over 200 laparotomies without hemorrhage. He continued desiccation for from one-half to two minutes. Downes' improvement of Skene's instrument lay in the raising of the temperature to 212° F., the insuring of cool handles to the instrument and an increase in the degree of pressure. A maximum current of 60 amperes is necessary. The advantage of this is that the heat developed in the platinum causes the blades to heat more rapidly than with a lesser current, and there is less risk of burning out the platinum. Intestinal resection and anastomosis, in Downes' opinion, can by these instruments be made ideal.

THERAPEUTICS.

Active Principle of Suprarenal Tissue.—E. ABDERHALDEN and P. BERGELL (*Münch. med. Woch.*, June 7, 1904) have succeeded in obtaining the active substance of the suprarenal gland in chemically pure form. This epirenan forms pure white crystals which do not change color, even if kept in solution for months. A solution 1-1,200 to 1,300 corresponds in strength to a 1-1,000 solution of adrenalin or suprorenin. If a 1-1,200 solution is passed into the stomach of a dog, almost the entire amount can be recovered, showing that the vascular spasm in the stomach is so intense that hardly any absorption goes in. It would then be interesting to try epirenan in hemorrhage from gastric ulcers, etc.

Action of Salicylates on the Kidneys.—Careful urine examinations were made by E. KNECHT (*Münch. med. Woch.*, May 31, 1904) on patients who were receiving salicylates for rheumatism, but did not suffer from renal complication before treatment. That renal irritation may follow seems undoubted, but is hardly an argument against the use of salicylic acid for slight albuminuria with few casts were found in only seven out of forty cases. C. KLIENEBERG and R. OXENIUS (*Deutsch. Arch. f. klin. med.*, Vol. 80, Nos. 3 and 4) have studied the same question, and arrive at somewhat different conclusions. Albumin and casts are found in a surprisingly large number of normal individuals and patients suffering from rheumatism before they receive salicylates; after treatment the traces of albumin are more marked, the casts more numerous, and the epithelial cells very abundant, so that there is no doubt that a desquamative catarrh of the entire urogenital tract is set up in most cases. Even coarsely granular and waxy casts were occasionally encountered. A peculiar property of the nephritis is that it disappears even if large doses of salicylic acid are continued. Clinical symptoms of nephritis never appear, and in a patient already suffering from chronic nephritis, the albumin rapidly diminished with antirheumatic drugs, so that above observations possess more theoretical than practical value.

Lithiomercuric Iodide.—It has been generally assumed that the active radical of soluble mercuric salts is the mercurial, and that the higher the percentage of mercury, the more destructive the compound to bacteria. It has been shown, however, that mercuric iodide is fully three or four times as powerful in its effects on bacteria as corrosive sublimate, indicating that the combined iodine is as important a factor in the bactericidal action of the salt as the combined mercury. R. C. ROSENBERGER and J. W. ENGLAND (*Am. Med.*, June 25, 1904) have found that lithium iodide forms a compound with mercuric iodide which possesses features of superior value. It contains about 34 per cent. of mercury, 65 per cent. of iodine, and 1 per cent. of lithium. It is believed that it will decompose the alkaloidal toxins of micro-organisms more effectively than the other mercuric salts, and as it is not precipitated by fixed alkalies, the solution is not decomposed by the alkalies of the blood or the blood serum. A lesser quantity is required and hence there is less danger of mercurial poisoning. As regards the antiseptic action of the reagent, it was found that a 1—16,000 solution readily inhibited the *Bacillus coli, Bacillus pyocyaneus, Bacillus anthracis,* and *Streptococcus pyogenes* for twenty-four hours. The presence or absence of albumin made no difference.

Radium, Finsen Light and X-Ray.—These little understood agents are constantly before the questioning members of the profession. With all the work that has been done on them it is little short of wonderful that no progress has been made toward answering the problem as to how they do their work. C. M. O'BRIEN (*Brit. Med. Jour.*, July 23, 1904), considers that there is too little radium in the world to make its use a serious question, particularly in view of the fact that we have other agents which, to all appearance, do the work much better. He points to the very interesting sequence of events which began with the discovery by Koch in 1882 of the tubercle and, furthered by Finsen, Roentgen and Becquerel, ended in 1898 by the discovery of the Curiès. The unknowable "personal equation" which figures conspicuously in the therapy of all the radio-active agents is all important in the case of radium. He concludes with the statement that the combined use of X-ray and Finsen light affords the best chances of success.

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WALTER REED AND THE PANAMA SANITARY OUTLOOK.

THERE are still many doubts in the minds of medical men, as well as the general public, concerning the early results of the American attempt to dig a canal at Panama. As to the ultimate success, of course, there is no possible hesitation; but the question is, How many lives is it going to cost, and is American control going to prove any more successful in solving the problems of sanitation and in reducing the enormous death-rate among the workmen which has proven the main obstacle in constructing the canal?

Malaria and yellow fever are two special sources of danger that must be avoided, if every foot of the canal is not to cost a human life. The problem then is whether our modern advance in the knowledge of the distribution of these and kindred diseases is sufficient to insure protection against them to such an extent as to make them at most passing visitants rather than enduring companions of the work across the Isthmus.

It seems that in a measure these problems have been solved, but the test of the solution on a large scale remains to be made. The attitude of sanitarians with regard to the precautions necessary to be taken is very different at the present time from what it would have been even five years ago. When the American occupation of Cuba was forced upon us it was thought that an improvement in the general sanitation of Havana would surely bring about a reduction in the death-rate from yellow fever. For the first year this seemed to be true, and while there was a reduction of more than one-half in the death-rate from all diseases, there was a distinct diminution also in the incidence of yellow fever, and one of the great menaces of the tropics seemed to be abolished. The next year, however, in spite of the most scrupulous municipal cleanliness and insistence on sanitary precautions of every kind, yellow fever raged with more virulence than for many years. More than half of the Governor-General's staff died from the disease, and Cubans were not slow to proclaim that yellow jack would prove too much for the Americans and all their sanitation.

Then came the splendid work of Walter Reed and his band of companions, and within a year the yellow fever problem was forever solved. The disease has not caused any alarm in Havana since, and for practically three years there have been no cases of the disease reported. This, too, notwithstanding the fact that when yellow fever is imported no special precautions are taken to avoid a contact with patients, and the only sanitary regulation is the absolute seclusion of the yellow fever sufferer from mosquitoes. As the result of this Cuban experience it can be said confidently that yellow fever at least will not play an important rôle in causing a high mortality among the laborers along the Panama Canal. What has been accomplished in Havana and elsewhere in Cuba, as well as in Porto Rico, can be done quite as effectually and with the promise of as much success in the canal zone, since the sanitary regulation of this territory is to be under the control of the men who have solved the problem in Cuba.

There remains malaria. This too, is a mosquito-borne disease, and as the result of the experience with yellow fever in Havana, not a little has been learned as to the possibility of reducing the incidence and mortality also of this possible cognate disease. Instead of the vague efforts at protection against this disease by the avoidance of the supposedly mephitic night air, by the consumption of quinine and whisky and care with regard to the possible malarial infection of the water supply, the prophylaxis of this disease has resolved itself into a set of very definite purposes.

Colonel William Gorgas, of the Medical Corps of the United States Army, who is to have charge of the Government's sanitary work in the Isthmus of Panama, has recently stated in the *Review of Reviews,* just what is to be attempted in order to prevent the spread of malaria. Most of the dwellers in the canal zone have had malaria, and many are sure to suffer from relapses. As the district abounds in mosquitoes the communication of the disease to foreign workmen who come in is sure to take place unless due restraint is placed on the mosquitoes. The whole effort of the sanitary corps will then be centralized on the single purpose of preventing mosquitoes from acquiring malaria from those already ill with the disease and then transferring it to those who have not as yet had it.

This will not be as difficult as might be thought, for it is proposed to organize, as in Panama, mosquito brigades in all the villages, whose work will be to destroy every possible breeding place of the mosquito and thus keep the number of the insects down to the lowest possible limit. Besides, all of the present population who have suffered from malaria are to be registered and the state of their health is to be the subject of regular inspection. Whenever they are suffering from a relapse of their malaria they are to be carefully protected from the possible approach of mosquitoes. This has been done with not a little success in Havana. It is believed from investigations already made in Panama that the yellow fever-bearing mosquito seldom wanders more than one hundred yards from the pool in which its antecedent larva was deposited and infected.

All this looks simple enough now. The very favorable outlook, however, is due entirely to the work of one man, Dr. Walter Reed, who, in his quiet, unassuming way, accomplished as much for medicine as did Jenner, Lister or Pasteur. His greatest monument will undoubtedly be the fact that the canal at Panama will be finished without the awful loss of life that would otherwise be unavoidable. It is only proper and befitting his position as an American medical man that another and more formal monument to him should proclaim to admiring countrymen how much the fellow members of his profession appreciate the work that was so successfully accomplished by this compatriot whose untimely death cut off one of the most distinguished physicians of his generation, but whose memory shall remain for all time as one of the glories of American medicine.

X-RAY TREATMENT OF LEUCEMIA.

WHILE periods of marked and at times of long-continued improvement are not at all uncommon in the course of leucemia an actual arrest of the disease with complete recovery has thus far not been observed. Even in the remarkable case of the myeloid type, recently reported by Simon and Campbell (MEDICAL NEWS, July 23, 1904), in which, associated with great improvement of the patient's general condition, both the splenomegaly and the myelocytosis disappeared and have remained absent for over a year, it would hardly be warrantable to speak of a recovery. The writers themselves share this view. They state that "notwithstanding the general improvement and the disappearance of the splenomegaly and the myelocythemia there can scarcely be any doubt that the arrest of the disease is merely temporary, if indeed there is an arrest of the pathological process."

In view of the extremely grave prognosis, which the disease thus offers, with the older methods of treatment the results of recent investigations regarding the effect of the X-rays upon the progress of leucemia are most interesting and deserving of careful attention. The earlier reports dealing with the treatment of leucemia and allied conditions with the Roentgen rays have apparently been overlooked, and credit is usually given to Senn for its introduction. The right of priority, however, undoubtedly belongs to Pusey, whose first report appeared in the *Journal of the American Medical Association* of January 18 and April 12, 1902. Since then additional cases of leucemia treated in this manner have been recorded by Senn, Grad, Brown, Bryant and Crane, Grosh and Stone in the United States, by Krone and Ahrens in Germany and by Bozzolo in Italy. Altogether there are at present available data regarding the X-ray treatment of the disease in nine cases of the myeloid type and in three of the lymphadenoid variety. Barring the first of Pusey's cases, in which no success was had, distinct improvement is recorded in all the remaining cases. This has reference not only to the patient's general condition, but also to the splenomegaly and the blood changes. The improvement begins early and is progressive. That this is the direct result of the treatment can scarcely be doubted. In this respect the study of a single case is perhaps not altogether convincing, but a careful survey of the series certainly warrants the conclusion that in the X-rays the profession now has a definite means by which it can influence the

metabolism of lymphoid tissue. To judge from recent investigations of Heineke it appears, in fact, that the reaction on the part of the lymph follicles of the animal body to the X-rays is very much more delicate than that of the surface epithelium. For he could show that in dogs of medium size exposure of the abdomen to a hard tube at short range for fifteen minutes is sufficient to produce distinct nuclear fragmentation of the follicles of the spleen and the mesenteric lymph glands, which can be demonstrated after a few hours. Similar changes undoubtedly occur in the lymphadenoid structures of the leucemic patient as the result of the X-ray treatment, and are probably responsible for the marked and rapid diminution in the size of the spleen, and in the lymphadenoid type of the disease of the lymph glands. To this rapid disintegration of cellular elements in turn the constitutional symptoms are unquestionably due, which in some instances are so very marked, and may indeed assume very grave proportions.

In what manner the X-rays produce the ultimate beneficial effect upon the leucemic patient, whether through direct influence upon the primary etiological factor, or secondarily in consequence of the tissue destruction and the coincident liberation of specific antibodies, these are questions which at present can only be subjects of speculation.

As regards the final outcome, sufficient time has not elapsed since the report of the various cases to warrant any far-reaching conclusions. To speak of a cure, as Senn especially has done, is certainly not justifiable. His myeloid case, in fact, has already relapsed, and two other cases (Grosh-Stone, Ahrens) have died. The results, however, are nevertheless sufficiently encouraging to warrant the adoption of the X-ray treatment as a matter of routine in the management of these cases, in addition to the older methods, and especially the use of arsenic in the high doses suggested by Osler.

In conclusion, we should suggest that future reports be made somewhat more extensive than has been the case with the majority of those recorded so far, and that careful attention be directed to the blood changes not only for diagnostic purposes, but also in order to afford a control of the treatment instituted. Especially important in this sense is the behavior of the mast cells, which unfortunately has been neglected in most of the reports. It is interesting to note that in the case reported by Simon and Campbell, above referred to (not treated by X-rays), the mast cells remained high, even after all other symptoms of the disease had disappeared.

"FROM YOUTH TO HOARY AGE."

WHETHER moral suasion is superior to corporal punishment and should supersede it has been a mooted question ever since the days of Solomon's didactic and ex-cathedra statement, that to spare the rod was to spoil the child. The trend of modern medical civilization, however, has been undoubtedly to eliminate the latter. Scholars in the large public schools of Great Britain are no longer "hoisted or swished." The big white Czar of all the Russias, luckily for himself and his kingdom, abolished the knout before they became "busy" with the little bee, in the Japanese bonnet, that is now rendering so uneasy the head that wears the Slavic crown. Flogging has been done away with in the navy, and it is now a court-martial offense for an officer to strike an enlisted man. Even the assailant of the classical "Billy Patterson" is a fugitive from the outraged laws of an offended country, and there is no longer any opportunity for the professional exponent of humility to turn the other cheek.

"Moral suasion" is unquestionably a great force, and if it failed the other day, when some dozen guards of a homeopathic insane asylum sat by the river on the gunwale of an unmoored boat, with their brass buttons shining on their blue coats like the stars on a summer sea, and piteously begged an escaped lunatic, who was struggling in the rapid tide, to come back (like Lord Ullin's daughter), it was not their fault that the system did not work. This was undoubtedly the exception that proved the rule; the experiment that, while it failed, left the principle the same.

On the other hand, the question naturally arises, are we not at times, like the world, "governed too much," and does not a law, that may be unquestionably righteous and just for the masses, work often great injustice to the individual? Thus, that much-derided owner of the two dogs who cut two holes in his fence, a big one for the large dog and a little hole for the small one, may have cut much better than either he or his critics knew. For there might easily be circumstances in the canine existence that would render it very hard and humiliating for the little dog to pass through the big hole, even though it was much too large for him. Only a few weeks ago a judge on the bench in Virginia publicly announced that he unreservedly favored the restoration of the whip-

ping-post as a cure for the chronic wife-beating diathesis, and there are few members of the medical profession who will not agree with him. And yet this same judge, by the inflexibility of the statutes, would be compelled to mete out a heavier punishment to a starving woman who stole a loaf of bread for her hungry children than he would to "the man who would raise his hand against a woman save in love and kindness," whom the late Edwin Forrest anathematized so forcibly.

Luckily, however, a wise judge can, if he so desires, at least temper the wind and add the warmth of the judicial ermine to the scanty pelt of the shorn lamb when it is of tender years. That he does not always do it, however, is true, and the arrest, trial and subsequent conviction of a few boys for playing ball on a vacant lot, in a neighboring town, seems to be another instance of misapplied judicial zeal and a case where the fine points of the law would have been more honored in the breach of the offenders than in the observance of the municipal regulations.

As we have said, class legislation is always a delicate matter to undertake, and the age limit has more to do with the division of a population or a community of persons into sections than either the possession of wealth or the inheritance of social standing. Boys will be boys, and the production of a bat and a ball is two-thirds of a problem, of which the finding of an unoccupied field is a complete solution. For good, as the common-school education in this country undoubtedly is, there are few specimens of the primary classes that are able or willing to read the writing on the wall, particularly when it takes the form of a notice to trespassers, or an injunction to keep off the grass.

Of course, in a large city, where the lots are small, and where the passers-by are consequently in danger of being struck by the ball, or the neighbors are near enough to be disturbed by the noise inseparable from a congregation of boys, it would be impossible to permit the frequent gathering together of a youthful community, either in the name of baseball, football, marbles, or whatever game the season has brought in vogue. But even then verbal warning may be given, and we cannot help thinking that the popular indignation that seems to have arisen locally in this case might have been avoided if the village Dogberry had exercised a little tact, or if the magistrate, like "Father William," had only remembered the days of his youth. For there is a popular belief in the minds of all of us that we can only be young once, and though this seems to have been an overliberal estimate, in the case of these municipal authorities, yet a timely recollection of it is the key-note of all successful government.

It may be true that the laws are not enacted for the individual, but are framed for the masses, and of necessity must be the same. Yet, even then the sauce for the gosling need not be that for the gander, and the judge on the bench always has the ability to make the punishment fit the crime to a degree at least sufficient to remember that old heads do not grow on young shoulders, and that, as a rule, children do not wear hats of men's sizes.

There is a trite old proverb that "reformed rakes make the best of husbands." If this be true we cannot say, but we should not care to bring our case before a judge in whom age had staled and custom withered all the attributes of youth, and whose recollections of the past were tinged and saddened by his present aches and pains.

Both Solomon and David lived extremely happy lives,
And enjoyed themselves immensely with their horses and their wives,
But, when their blood ran colder, they were seized with aches and qualms,
Then Solomon wrote his Proverbs, and David wrote his Psalms.

ECHOES AND NEWS.

NEW YORK.

Convention of Chemists.—The first annual convention of the Society of Chemical Industry to be held in America will begin in this city at the Chemists' Club on Wednesday, September 7, and will continue until September 12. The foreign delegation will then be taken aboard a special train as the guests of the New York members for a trip through the South and Middle West. The society is an international organization, and members will be present from many foreign countries. One feature of the meeting will be a visit of inspection to the larger manufacturing plants all through this country. It is expected that many important questions relating to the chemical industry will be considered.

St. John's Guild.—Since July the seaside hospital of St. John's Guild has treated over 2,200 patients, and its floating hospital has carried out over 25,000 children and their mothers. This summer, as the Health Department has testified, has been marked by an unusually large amount of suffering among the children of the poor, and to deal with the emergency properly the guild has been put to so much expense that it now needs $15,000 additional to enable it to continue its hospitals in operation during the summer. The mere announcement of that need ought to be enough to bring in the money at once for so noble and necessary an institution of humanity. The hospitals are in charge of physicians of special ability, Dr. Abraham Jacobi being the president of its medical board, and in every respect the guild deserves support and commendation.

Bronx Typhoid.—There are now over 200 cases of typhoid fever in the Bronx, according to a canvass made

among private physicians there by Dr. M. S. Gregory, Acting Superintendent of Bellevue Hospital, and other officials of that hospital and its allied institutions. This number is far above the normal rate, and the presence of so many cases is renewing the fears felt a month ago, when many cases of typhoid were reported among the Italians who live in the Bedford Park section of the Bronx and work on the Jerome Park Reservoir. The number of patients is so large that it is causing Bellevue and its allied hospitals trouble in caring for them. Fordham Hospital, which is nearest to the place where their cases are said to have originated, has only twenty cots in its medical ward, and the overflow has been relieved by sending such patients to Harlem Hospital and to the Bellevue and allied hospitals, neither of which has much extra room. Dr. Gregory has given orders for the erection of a temporary cottage on the grounds of the Fordham Hospital. This will provide room for about a dozen typhoid patients. The epidemic is apparently of a mild type, only two persons have died of the malady during the first three weeks of August.

Sydenham Hospital Charges.—Charges have been made to the State Board of Charities against the trustees and managers of the Sydenham Post Graduate Hospital, at No. 339 East One Hundred and Sixteenth Street, by four physicians formerly attached to its staff. The complainants are Dr. Salo Cohn, Dr. Louis Lichtschein, Dr. A. L. Goldwater, and Dr. B. M. Feldman. Two of the four allege that they were required to pay for appointment of the hospital staff a certain sum down and an additional amount monthly. It is also charged in sixteen specifications that the hospital has been conducted "in an unsanitary, unlawful, negligent and improper manner." Tuberculosis patients are said to have been kept in wards with other patients, unlawful autopsies are alleged to have been held, violation of corporation ordinances in the matter of fire escapes is asserted, substitution of medicines is said to have been practised, and other abuses are alleged. The hospital was incorporated in June, 1892, and licensed in February, 1903, under a law passed in 1899. It receives no State aid, but because of the license granted by the State Charities Board, is subject to its inspection and regulation. Its president is W. L. Spiegelberg, whose connection with the hospital dates back only to January last, a period subsequent to the retirement of the physicians who now prefer charges. The hospital, as a result of the charges, which all its officers deny absolutely, was thrown open for public inspection yesterday. To the layman it appeared well equipped and properly conducted. The directors will meet to-night to consider the charges and decide on a course of action.

School Hygiene and the Growing Child.—In an article for the Educational Supplement of the New York Times, Dr. L. E. La Fetra discusses the relationship of physical, intellectual and moral growth and development. At whatever point in the educational system the boy has to stop to take up his life work, up to that point his training should have been broad and symmetrical; the training of the body should be recognized to be as important as that of the mind. The schoolroom should be large in proportion to the number of scholars, well lighted and so arranged that the light may come in on the left hand side of the pupils. Good ventilation is important, the current of air should pass from inlets high up on the wall to outlets low down on the same wall; the temperature should be between 64° and 62° F. for the larger children, 68° F. for the smaller, the rooms heated by indirect radiation. Besides the recitation rooms, the school building should have a gymnasium with shower baths and a swimming tank if possible. It is important to have sufficient ground around the school building for athletic sports; in the city the roofs could be used for playgrounds. To obtain the best physical development, which statistics show is essential to the highest intellectual growth, it is necessary in our civilized communities, where the natural activities of the average child have little place, to make gymnastic exercises a part of the general curriculum. Exercise, especially highly co-ordinated movements, develop not only the muscles, but the brain as well, and team games tend to raise the moral character. Bathing is of equal importance, for it stimulates the nervous system and prevents children catching cold, besides acting as a cleansing agent. Overfatigue must be guarded against, especially in children who are of a nervous disposition, anemic or growing rapidly; girls entering on the adolescent period are extremely liable to overfatigue. Signs of overfatigue: Awaking unrefreshed in the morning, inability to concentrate the attention, loss of memory and irritability should be watched for and guarded against. Competitive examinations are important factors in causing overfatigue, and should be eliminated as far as possible by substituting the daily recitation marks. The daily medical inspection of schools is a commendable feature of recent school regime. On the intellectual side, too much stress is put upon certain fads, and not enough on the fundamental studies. The recitation periods should be short, with the most difficult subjects in the morning. Elective studies have no place in any grade below the latter part of the high school; disciplinary studies are of the greatest importance. In the higher grades hygiene and some knowledge of the processes of reproduction should be taught. Manual training is of great value in that it combines physical and mental training. Courses in domestic science are valuable adjuncts to education of girls.

Resignation of Dr. Millican.—Having had repeated for the third time an invitation to go to St. Louis and take over the management and editorship of the St. Louis *Medical Review*, Dr. Kenneth W. Millican, of New York city, has decided to accept. For six years Dr. Millican has been a member of the editorial staff of the New York *Medical Journal*, and in this capacity has impressed its readers with his broad culture, untiring energy and unusual literary ability. In losing Dr. Millican from the position of Associate Editor, the New York *Medical Journal* suffers a loss that will not be easily repaired. In his new relations the MEDICAL NEWS bespeaks for Dr. Millican an early recognition of his worth, and wishes him and the St. Louis *Medical Review* the success which their combination merits.

PHILADELPHIA.

Additions to Almshouse.—Estimates have been asked for the construction of seven new buildings for the Almshouse being erected in the Forty-first Ward. The administration building has already been completed.

Pittsburg to Build Filtration Plant.—Mayor Hays has signed the ordinance authorizing the issue of $5,000,000 bonds for the construction of a filtration plant. This measure has been agitated for a long time, and even now the city controller will contest the ordinance on the ground of a technical flaw in its passage.

New County Medical Societies.—The physicians of two Pennsylvania counties have recently organized medical societies. On July 29 a society of 15 members was formed at Bedford, in Bedford County. Dr. S. G. Statler, of Alum Bank, was elected the first president. August 25, the physicians of Adams County formed a society at Gettysburg, with Dr. J. W. C. O'Neal, of that place, as president.

Pennsylvania Medical Journal.—The editorial management of this journal favors an increase in size of 8

or 16 pages. This change would permit the publication of papers read before the county societies; at present there is barely room for those read at the meeting of the State organization. The Bucks County society has endorsed this proposed increase, and the question will probably be presented to the State society at the coming meeting.

Medical Society of the State of Pennsylvania.—The annual meeting of this society will be held in Carnegie Hall, Pittsburg, September 27 to 29, 1904, under the presidency of Dr. W. B. Ulrich, of Chester. As at the meeting of last year, two sections will be held on the second day and the first session of the third day. The addresses will be given by the following: Medicine, Dr. Henry Beates, Jr., Philadelphia; Surgery, Dr. W. D. Hamaker, Meadville; Obstetrics, Dr. X. O. Werder, Pittsburg; Hygiene and State Medicine, Dr. A. C. Abbott, Philadelphia; Neurology, Dr. W. K. Walker, Dixmont; Laryngology, Dr. D. W. Mears, Scranton.

Disinfection with Ozone.—An experiment is soon to be tried in Philadelphia which may be of value to communities that are in need of purer water supplies than they now enjoy. The New York *Tribune* states that a private corporation in that city is erecting a plant on the banks of the Schuylkill for the purpose of showing the superiority of disinfection with ozone over the system of sand filtration adopted by the municipality and already in service along the Delaware. The method about to be tried has been introduced on a small scale in two or three foreign cities, but is practically unknown in America. It differs from that employed by Albert E. Wolf, of this city, ten or twelve years ago, and by M. Hermite, in France. Those men treated salt water with electricity, and thus liberated both ozone and chlorine. The new process produces only the former and obtains it from the air. By means of suitable electrical apparatus the oxygen is separated from the other gases with which it is associated, and is so modified as to acquire powerful germicidal properties. These are exercised upon contaminated water if the ozone is permitted to bubble up through the fluid, and at the same time the latter is clarified and deodorized. Up to the present time filtration has done more for the purification of water in which the bacteria of typhoid fever and other diseases are present than any other mode of treatment. Its benefits are not uniform. Through mistakes of administration it occasionally fails to yield the expected results. At best it only reduces the number of microbes. It does not completely eliminate them. Still, it has materially lowered the death rate in many localities which formerly suffered a heavy mortality. To convince disinterested sanitary engineers that the use of ozone will prove more satisfactory in the long run will be by no means easy. A system which works admirably in the laboratory does not always behave equally well on a large scale. It is easy to believe that if a globule of ozone comes in contact with a mischievous bacillus the latter will be instantly killed. Whether a sufficiently thorough commingling of the gas with the water can be insured to reach all the germs in the fluid is another question. A second essential to efficiency is continuity of operation. If the machinery gets out of order there must be an interruption either of the water supply or of the disinfection, and instances of the latter kind appear to have occurred at Wiesbaden. It is to be hoped that the apparatus which is about to be installed in Philadelphia will have an endurance test, to clear up uncertainty on this point. If the men under whose auspices the venture is made can also demonstrate the economy of the process, they will overcome doubts which have been entertained by experts who apparently have none regarding its excellence. Cities which cannot supervise and control the territory from which their water supply comes are exposed to peculiar danger. Practically all of the typhoid epidemics which occur in this country and Europe result from such inability to prevent contamination. The only resource left in cases of that kind is to purify the water before it is distributed for consumption. The number of communities which have neglected to adopt one safeguard or another is astonishingly large. In the near future the scope of their choice may be considerably widened. In a dozen or more places the copper sulphate system is undergoing a trial this year, and before many more months have elapsed a correct judgment of its value should be possible. If the regeneration of water from the filthy and poisonous Schuylkill should prove effective and cheap, an additional instrument for much needed sanitation will be available.

CHICAGO.

Election of Dr. James.—President Edmund J. James, of Northwestern University, has been offered and has accepted the presidency of the University of Illinois, and will assume the duties of his new office November 1.

Laboratory for the State Board of Health Established.—It is said that the State Board of Health has secured orders in Springfield for a laboratory which is being equipped with the chemical and biological apparatus necessary for carrying on the work of the Board, with special reference to examinations of water, the prevention of communicable diseases, tuberculosis, etc.

The Milk Question.—The *Weekly Bulletin* of the Chicago Health Department has the following to say with reference to the question of milk: "The dealers in the city, who receive milk, were given individual warning to the effect that such milk was from cows that were being improperly fed, and that they must not receive it or sell it in the city of Chicago. Those who did not comply have been prosecuted and fined. A great many dealers have also been fined for not returning their milk cans to the shipper clean and dry. It is a well-known fact that a small amount of sour milk will readily sour a large can of fresh milk. This sour milk produces digestive troubles in children, such as vomiting, flatulence, and diarrhea. Other diseases, such as tuberculosis, which is very prevalent among cows, may be conveyed by milk. The dairy inspectors are paying especial attention to this fact."

Conveyance of Typhoid Fever, Scarlet Fever and Diphtheria by Milk.—"Typhoid fever, scarlet fever and diphtheria are sometimes conveyed by milk; especially typhoid, if the cans and bottles are washed in foul water and not sterilized. Cities well supplied with water of good quality and having a modern sewerage system derive typhoid fever only from contaminated country milk or vegetables or the return of people in the autumn from less sanitary places. The bacteria in milk produce acids and toxins, which are injurious to infants and invalids. To destroy these milk is often pasteurized. This, however, is somewhat objectionable, as it destroys certain enzymes that are necessary for the digestion of the milk. It is easy enough by diluting pasteurized cow's milk and adding milk sugar to obtain milk identical in per cent. of its principal constituents with mother's milk, but the trouble due to the indigestibility of the caseins remains, therefore, mother's milk is about the only thing for the baby."

Improvement in the Public Water Supply.—"For the second time in ten years a rainfall of more than three-quarters of an inch in twenty-four hours has failed to cause contamination of the public water supply of Chicago. The first on record was that following the rainfall of July 31, which was more than

nine-tenths of an inch. During the twenty-four hours ending at 7 P. M., Aug. 19, there was a precipitation of more than one and one-fourth (1.27) inches, but the chemical determinations of Aug. 20 showed a purer water at each of the nine pumping stations than samples taken seven miles from shore and identical with samples taken twelve miles from shore. There is no obvious or plausible reason for this but the continuous operation of the drainage channel. This is the fifth year that an average of more than 300,000 cubic feet per minute, night and day, has been flowing from the lake down the Desplaines and Illinois valleys, and during this time there has been the reduction in deaths from the impure water diseases shown in the following table—the dividing line being January, 1900, date of opening the channel:

Deaths from—	Four Years. 1896-1899	Four Years. 1900-1903.
Acute intestinal diseases.....	8,119	8,898
Rate per 1,000 of population.....	16.41	12.44
Typhoid fever.....	2,266	2,235
Rate per 1,000 of population.....	3.68	3.10

"If the rate of the four years 1896-1899, before the opening of the drainage channel, had obtained during the last four years, there would have been 11,724 deaths from the acute intestinal diseases and 2,629 from typhoid fever, or 2,826 more from the former and 394 more from the latter (a total of 3,220) than did actually occur. The money value of these 3,220 lives—16,100,000—is only one item to be placed to the life-saving credit of the drainage channel; a larger, but intangible amount would accrue, if physical suffering of the victims, mental suffering of parents, wives and husbands and impairment of vital resistance of the survivors could be figured out in dollars and cents. From the standpoint of public health the drainage channel is the best investment Chicago ever made."

Decreased Death Rate for August.—The average August death rate of the last decade was 1.84 per one thousand of population, and the lowest during that period was 14.53 in 1901. For the first twenty days of August the rate was 12.67, and for the week ending August 20, the 437 deaths reported represent an annual rate of only 11.62. These figures show a reduction of 20 per cent. from the previous lowest, and of 31 per cent. from the previous August average. The deaths numbered 437, of which 108 were from intestinal diseases; 59 from consumption; 34 from violence; 29 from Bright's disease; 26 from cancer, and 25 from pneumonia.

A "Hospital" of the Past.—"Twenty-five years ago the Cook County Hospital," said Dr. I. N. Danforth, "stood at the corner of Eighteenth and Arnold streets. In close proximity was a slaughter house where a chime of ear-splitting squeals testified to the constant march of porcine mortality, while frequent odors of "rendering" tanks added most convincing confirmatory evidence. The neighborhood was then infested with lager beer saloons, soap factories, cooper shops, and other noisy and fragrant adjuncts, while the constant snorting of locomotives and the rumble of railway cars, including the ceaseless switching of freight cars made up a pandemonium sufficient to weary a well man and drive a sick man crazy. Smoke, dust, dirt of every conceivable kind, darkened the air, offended the nostrils, provoked "sternuation" (vide Sir Walter Scott), and soiled face and hands and clothing, although most of the hands and faces found in that locality were not essentially changed thereby. In such a locality as this and amid such surroundings as these, stood the old County Hospital—but let us look at the institution itself. The edifice was an ugly rambling affair, built I know not when or for what purpose; when I first knew it in 1867, it was thoroughly out of repair, and was odiously repulsive in all its appointments. It was ill-kept; the wards were dirty, the ceilings grimy, the furniture unclean, the beds and bedding were unfit for the steerage of an emigrant vessel, and the whole aspect and make-up of the concern was a disgrace to Chicago and Cook county. Rats and mice galloped about the corridors, infested the wards, and frequently invaded the beds of the patients. Cockroaches abounded in solid battalions; mosquitoes and flies in hungry clouds buzzed through the wards; while an "offensive bug which infests beds," called by a gentleman named Baird the *Cimex lectularius*, provoked a deal of both profanity and scratching on the part of patients who were sufficiently vigorous to do either or both. A more detailed description of this hideous concern would only set forth its repulsiveness in stronger colors. It was *all* bad, except the Medical Board, which was generally made up of able devoted men who did the best they could to make the institution respectable. The nursing service was unique; the nurses were always political appointees; that is, men and women who in some way could "influence" voters. The "rich Irish brogue" which so captivated that old political peacock, Gen. Scott, during his barren Presidential campaign, was "endemic" among the nurses, although a German or Scandinavian expletive, occasionally broke the silence and varied the discordant jargon. Of course, the cooking was execrable and the patients constantly complained of their miserable food, and of the disgusting manner in which it was served. In the year 1878, the Chicago daily papers, being incited thereto by a deputation of physicians—whereof the writer was one—investigated the Cook County Hospital, and proceeded to mercilessly expose its disgraceful condition—in the name of the outraged sick poor they demanded a thorough reform, and they got it. Never did a Board of County Commissioners get a more thorough scorching; never did said body more thoroughly deserve such scorching, and never did a drastic remedy produce more immediate and radical results. The present stately hospital of Cook county is directly due to the potent influence of the daily papers—the newspaper press—and its influence was experienced none too soon."

GENERAL.

Officers of Pan-American Medical Congress.—The following officers of the Fourth Pan-American Medical Congress have been appointed: Dr. Julio Ycaza, president; Dr. Manuel Coroalles, vice-president; Dr. José E. Calvo, secretary; Dr. Pedro de Obarrio, treasurer, and Drs. J. W. Ross, J. Tomaselli, M. Gasteazoro, committee.

New York and New England Association of Railway Surgeons.—The fourteenth annual meeting of the New York and New England Association of Railway Surgeons will be held at the Academy of Medicine, New York City, Nov. 17 and 18, 1904, under the presidency of Dr. C. G. J. Finn, of Hempstead, Long Island. Railway officials and all surgeons interested in this work are cordially invited to attend.

The Aquiline Nose and Voice Development.—Dr. Louis Robinson asserts that the aquiline nose is requisite to a full development of the human voice. His contention as to the origin of this feature, according to the *Medical Times*, is that through the night of unrecorded time during which primitive man was slowly and painfully progressing toward civilization, the voice was the only rational means of exercising influence. Oratorical ability and a sonorous voice thus became of exceeding importance to the aspiring and ambitious, and the ulti-

mate formation of an aquiline-nosed race would become the necessary result of the better assured survival of such favorably endowed individuals. Thus, says the *Popular Science News*, the long nose would tend to become masterful, to form; first, an aristocracy, and ultimately so to leaven a people as to insure their dominance, as was the case with the Romans. Dr. Robinson cites the North American Indian, the Moaris and the Basuto negroes, among whom are the celebrated Zulus, as instances of large-nosed and oratorical peoples.

The Waldeck-Rousseau Operation.—M. Waldeck-Rousseau was operated on on May 5 for cancer of the liver. According to the general understanding the operation was only partly successful, but it enabled the patient to gain strength enough to warrant his removal from Paris to Corbeil, where it was hoped the country air would restore his strength entirely. A second operation was performed on August 10 by Professor Kehr and Dr. Armour, a Canadian surgeon, assisted by three French surgeons, after a consultation at which it was decided that since the liver had ceased to perform its functions an immediate operation was the only hope of saving the patient's life. It at first appeared that the operation would prove successful. But the pulse became more feeble, and despite the administration of injections M. Waldeck-Rousseau gradually sank and died without gaining consciousness. Professor Hans Kehr, of Halberstadt, in the *Medicinische Wochenschrift*, defends himself against the attacks of French medical journals on the operation performed on ex-Premier Waldeck-Rousseau. He says that the patient had absolutely no chance to recover without an operation, whereas an operation saves 34 per cent. of such cases. M. Waldeck-Rousseau had nothing to lose through the operation, since he had only a few weeks, perhaps months, to live, and an operation was the only hope of saving him.

Report of Committee on Determination in England.—The English Inter-Departmental Committee on Physical Deterioration has issued its report in London, and makes the following recommendations: For the collection of definite data bearing upon the physical condition of the population a permanent anthropometric survey should be organized to take measurements of children and young persons in schools and factories. A register of sickness not confined to infectious diseases should be established, and an advisory council created, the composition of which might be modeled on the French Consultative Committee of Public Health, to apply information derived from the anthropometric survey and the register of sickness, and to advise the Government on points concerning public health; and the local authority, as an experimental effort in the direction of fixing a standard of overcrowding, should notify in certain of the worst districts that after a given date, no crowding in excess of such standard would be permitted. On the subject of alcoholism, the committee advocates systematic practical training of teachers to enable them to give rational instruction in schools on laws of health, including demonstrations of the physical evils caused by drinking, whereby more may be done to check degeneration resulting from drink, by bringing home to men and women the fatal effects of alcohol on physical efficiency. Impressed with the enormous sacrifice of infant life due to insufficient or improper feeding, the committee believes the ultimate remedy lies in the instruction of girls in the process of infant feeding and management, and recommend the establishment of health associations for training of mothers in hygiene, and that girls over fourteen might be made to attend occasionally municipal crêches wherever established. A further recommendation is to prohibit the sale of tobacco and cigarettes to children.

Copper as a Typhoid Germicide.—Attention has lately been attracted to the confident announcement made by Dr. Edward Martin, of Philadelphia, Director of Public Health and Charities, that water infected with typhoid germs may be sterilized without boiling or filtering, by permitting it to stand in copper vessels for four hours in the ordinary temperature of living rooms, or for twenty-four hours in a refrigerator. Dr. Martin further states that the specific infection of Asiatic cholera in water may be destroyed by the same means. This hypothesis had previously attracted some attention in Washington, and a suggestion has been made that the soldiers of the United States Army be provided with canteens made of copper, to the end that the always large and hitherto unavoidable risk of typhoid fever, dysentery, and like diseases in camps and barracks may be minimized. In editorial comment, the New York *Times* says, that very likely water allowed to stand in copper vessels until it has taken up a certain amount of the metal in the form of soluble salts is sterilized, such salts acting as germicides with a special antipathy for typhoid and cholera bacilli. This might be true, and yet the discovery not be the priceless boon to suffering humanity which at first glance it would seem to be. There are a number of possible additions to water which would have this effect, but which the conscientious chemist would hesitate to recommend for general family use. As the rule water, if pure and wholly free from carbonic acid, will not attack copper, but when a surface of that metal is exposed to the action of air and water in combination it is more or less energetically attacked, especially if any acid is present. Inasmuch as unboiled water usually and moist air always contains carbonic acid, copper exposed to the action of either is more or less rapidly coated with a film of basic carbonate, popularly but incorrectly called verdigris. Copper is a metal which is readily dissolved in the weakest acids, and also in weak alkaline and saline solutions. Up to this time it has been considered a safe generalization, verified by numberless observations and experiments, that all potable waters will dissolve more or less copper and that all its soluble salts are more or less energetically poisonous. Some of the salts of copper, notably its basic carbonate, are not soluble in cold water, and may be removed by filtration, but most of them are both soluble and poisonous, and some of these are likely to be formed with the carbonate, or in acid water without it. The action of the soluble salts of copper on the human system is indicated by nausea, violent headaches, cramps, and acute pains in the stomach and bowels, faintness, convulsions, and even death. Boiling suspected water is a good deal more troublesome, no doubt, than storing it in copper vessels, but it is preferable from every point of view, and effective filtration is better than either.

Fair for Nassau Hospital.—A fair for the benefit of the Nassau Hospital, of Mineola, will be held at Mr. and Mrs. Clarence Mackay's home, Harbor Hill, Roslyn, L. I., on Saturday afternoon, September 24, from 1 to 7.

Roentgen Ray Society.—The fifth annual meeting of the American Roentgen Ray Society will be held at the Louisiana Building, 911 North Vandeventer avenue, St. Louis, Mo., Sept. 9, 10, 12 and 13.

OBITUARY.

Dr. WILLIAM RHYS PRYOR, of New York city, died August 26, in his forty-seventh year, in St. Vincent's Hospital, where he had been ill for a fortnight. He was one of the most distinguished practitioners of obstetrics and gynecology in the country. Dr. Pryor performed an operation a few days ago at Blooming Grove, Pa., in a room in which the temperature was 104° F. After the

operation he collapsed. He was brought back to the city and taken to St. Vincent's Hospital. He was a son of ex-Justice Roger A. Pryor, of the Supreme Court. Although he had a large practice, his work was mostly charity work among the poor. He was graduated from the College of Physicians and Surgeons in 1881. Dr. Pryor had written several books of value to his professional brethren, among them "Text-Book of Gynecology." In addition to many medical and scientific societies, he was a member of the Manhattan, Colonial and New York clubs.

Dr. CHARLES NEWTON, of New York city, died at Nantucket, Mass., on Sunday, August 7. Dr. Newton graduated at Bellevue in 1884, became a well-known practising New York physician, and was for many years Surgeon of the Ninth Infantry, N. G. S. N. Y. He was a member of many medical societies and fraternities.

SOCIETY PROCEEDINGS.

CHICAGO ACADEMY OF MEDICINE.

Regular Meeting, held March 11, 1904.

The President, Wm. Allen Pusey, M.D., in the Chair.

Silver Salts in Gonorrhea.—Dr. Wm. L. Baum read a paper on this subject.

Dr. Fenton B. Turck stated that some time ago Dr. Howard A. Kelly, of Baltimore, followed out some of the work done by Guyon, of distending the bladder and observing the changes in the mucous membrane. Kelly used air instead of water. He found that upon distention it produced the usual anemia, followed subsequently by hyperemia, and that this process being continued, the condition found in cystitis was very much improved. Kelly presented some plates showing the differences before and after treatment. The question arose as to what was the physiological action of such pressure. It was evidently not due to the water or fluid used, but to the tension produced upon the vesical walls. Intermittent pressure or tension is a universal stimulant of all protoplasm. Various mechanical methods of stimulating the muscles, as used in the laboratory were mentioned illustrating tension in its various forms as a universal stimulant. According to the recent observations of Mathews and Wicher all protoplasmic activity was excited by various forms of motion. Parthogenesis of the egg of the starfish was produced by intermittent mechanical agitation. Tension being thus recognized, by most observers, as a universal stimulant it is not surprising to notice that similar results are obtained in the urethra. The question now obtains, What was the curative effect or what was the exact cause that brought about restoration?

Dr. Turck spoke, first, of hyperemia, saying it was recognized and admitted that hyperemia was the result of such tension, but only after the tension had been released. If the tension was continuous, there would be no such favorable result. It must be intermittent in order to act as a stimulus, and this tension and the release of tension must be more or less abrupt, the result being a greater activity on the part of the capillaries and of the contractile tissue. Rhythmical motion resulted from such tension, and this motion continued after its removal. It did not mean simply that passive congestion or stasis of the blood vessels was brought about, but that more blood passed a certain point within a given time than before. Such physiological hyperemia resulted in more active metabolism of the cellular tissues. With regard to increased leucocytosis being one of the important changes that takes place, he said that various stimulants or various exercises caused increased leucocytosis by bringing the leucocytes more to the periphery. There was now among the German and French investigators considerable controversy as to the value of leucocytosis in the curative processes of infection. It was known that hyperemia produced certain other conditions which better explains the various changes that occur. When more blood passed a given point at one time than at another, *i.e.*, a larger amount of blood brought to that part, a larger amount of activity occurs as the result of more rapid stimulation; there is a greater bactericidal effect, as well as antitoxic properties in the serum. This effect may be local or general. Recent experiments show a local effect upon the eyes of rabbits after artificial hyperemia, this hyperemia producing an artificial immunity. The studies the speaker had made had been in the direction of producing such stimulation in animals by mechanical means, showing the great immunity which can be produced by either mechanical or physical means, such as, for example, heat. Heat stimulation caused rapid hyperemia, this hyperemia acting with bactericidal and antitoxic effect. Attention was called to the effects of heat stimulation produced upon the arm in a case of local infection in which the continuous heat stimulation produced increased hyperemia, the latter causing an effect upon the bacteria already present, and the antitoxic effect in the serum curing the local infection. If further experiments could be carried on, they would very probably show that the hyperemia thus produced, that is to say, the more rapid circulatory effect in the urethra was the real factor in producing the bactericidal and antitoxic effect. The embryonal cells multiply and displace the old necrosed epithelium. He said it would be an interesting experiment to try the effect of tension produced by air instead of water, getting alternate pressure, and producing intense hyperemia in this structure, and experiments would probably show that air was equally as valuable as water for this purpose. He had found in other mucous membranes, such as those of the colon and stomach, quite as remarkable results were obtained by this alternate tension with air as with water. In fact, he thought air was preferable to the use of water. In water we have an incompressible substance, while in air we have a more elastic body, and considerable tension could be brought about without any harm, such tension resulting in a cushion-like effect, producing more powerful stimulation and resultant contractions. He further called attention to the experiments that had been made along this line of cushion-like effects by means of air. These experiments showed that such tension and its withdrawal was the most powerful of all local and general stimulants at the command of the physician. Heat sometimes might be increased, but the principal effect was derived from tension, and its abrupt withdrawal.

Dr. Turck stated that when he was a student in Berlin he saw a very interesting case in the nose and throat clinic of Professor Fraenkel, of pachyderma of the vocal cord, the diagnosis having been confirmed by the Professor himself. The patient was a woman who had frequent injections of iodine and of weak nitrate of silver solutions into the larynx some time before, and the question was raised whether this had not a good deal to do with the origin of the pachyderma of the cord. The woman was markedly anemic, which point was also brought out as a contributing effect, the anemia causing this pachyderma. But the work done by Dr. Fütterer showed that there was a trauma produced first, and in the center of this growth metaplasia occurred. One was almost compelled to accept the findings of Dr. Fütterer as a true metaplasia. In the case he reported

of pachyderma of the vocal cord chemical trauma undoubtedly played the important rôle. It was supposed to have been the starting-point of the pachyderma in the presence of anemia. One realizes how variable clinical conditions might be, but on the work of Dr. Fütterer one had the absolute experimental proof in the removal of a section, showing the ingrowing of normal glandular tissue and springing almost spontaneously from the center of this was the development of metaplasia.

Professor C. S. N. Hallberg asked whether or not it was the opinion of the essayist that the organic compounds were preferable to the nitrates? What led to the production of the organic compounds was that they were not caustic; that they would not form insoluble compounds with albumin or insoluble chlorides, and that it was these particular properties which gave them preferencé over the nitrates. He understood the essayist to say that the first effect of the silver compounds on the epithelia was favorable to exfoliation. He asked whether this was not produced in an equal degree by the nitrates as well as by the organic compounds?

Dr. Baum, replying to Dr. Turck, said that air was difficult to use in the urethra with an ordinary syringe. While it was of light specific gravity, it had one very great drawback in the treatment of diseases of the urethra, or in closed tubes of this kind, and that was that air was not a pleasant thing in cases in which there were erosions of the mucous membrane, so that air distention would have to give way to the more common form of distention with water, which was not only practicable, but could be obtained at any time. It could be kept in the urethra, whereas air would escape in spite of everything by the side and reduce tension too rapidly.

In regard to the strength of the various silver solutions, he did not see that the quantity of silver had any appreciable effect upon the results obtained, except there were some silver salts used in which the subjective symptoms were so much pleasanter than they were when other silver salts were used in preference to some of the later ones. As to nitrate of silver, there was no question in the author's mind, but what the subjective symptoms played an important rôle as far as the confidence of the patient and the ultimate results to be attained were concerned. There was much to be said about nitrate of silver in those cases where the resistance of the mucous membrane is greater, and especially in cases of posterior urithritis, the results were much more favorable than they were from the use of the organic silver salts. This was particularly true of gonorrheal cystitis. As to the comparison between the results obtained by the instillation of nitrate of silver and the use of the organic silver compound, he thought nitrate of silver was far preferable to the others. He looked upon it as being due to the one fact which must not be left out of consideration, namely, the mucous membrane of the bladder was non-absorptive, the exfoliation, which was induced by contact of the drug with the upper layers of the mucosa, was greater, and inasmuch as the penetration of the gonococci was not so great, for that reason, the nitrate of silver was preferable, and followed by much better results. In conditions of the urethra, where there was absorption probably, with a tendency toward infiltration into the submucosa, pressure and other methods were preferable. Referring to the remarks of Dr. Turck in regard to tension, as far as the bladder was concerned, he stated that practically the reverse applied to what it did in the urethra, and the use of nitrate of silver and of the organic silver salts was distinct when applied to the bladder or when used in the urethra.

Epithelial Metaplasia in the Stomach.—Dr. Gustav Fütterer read a paper on this subject, and gave a demonstration. Metaplasia properly so-called means metamorphosis of well differentiated cell structure into another equally well differentiated type. Pseudo- metaplasia designates changes of form due to mechanical conditions, but not of type. Change, for instance, of cylindrical epithelial cells into squamous epithelial cells, with all their characteristics (prickle cells, concentric arrangement and hornification) constitutes genuine metaplasia. Cylindric epithelial cells in a cyst flattened by pressure of the cyst contents retain the character of cylindric epithelial cells, and are instances, therefore, of pseudo-metaplasia. The terms anaplasia of Hansemann and cataplasia of Benecke designate a loss of differentiation, with increased power of proliferation. Physiologic metaplasia occurs in the stomach of the edentata (bradypus, halmaturus and manis), and in the stomach of the oviparous echidna; all masticate with their stomach, which plays the part of the crop in birds. Physiologic metaplasia has been found in the cat's trachea, which in fetal and young cats is lined with cylindric epithelium, while in the adult squamous epithelium is found in a certain spot of the trachea. Genuine epithelial metaplasias have been observed in the nose, on the tonsils, in the larynx, trachea, in bronchial tubes, in the lung cavity, in the middle ear, gall-bladder, renal pelvis, ureters, bladder, urethra, uterus, vagina and rectum. The literature, particularly of gall-bladder and genito-urinary carcinoma, demonstrated the close relationship between metaplasia and development of carcinoma. The only case of metaplasia in the digestive tract, reported is that of Bohm. Bohm reported a cancroid originating from the rectal mucosa, with an epithelial lining like that of the epidermis. Dr. Fütterer made 92 experiments on rabbits; an inch square of the mucous membrane and mucosa muscularis of the pyloric end was removed. Two instances of metaplasia were found in December, 1903, and in March, 1904. Examination in the first case revealed that the artificial defect was covered with mucous membrane differing from the rest in hardness and thickness. In the middle thereof a column of striated squamous epithelium branching deeply into the muscularis almost reaching the serosa was revealed by the microscope. The squamous epithelial nature of this column was indubitable. Hornification of the parts near the mucosa was shown by Gram's method. The origin of the squamous epithelium was plainly traceable to a very few (two to four) glands of mucosa. The growth pressure of this column was evident by its invagination of the muscularis, which was pushed through the stomach muscular wall almost to the serosa, without perforation. In this case the squamous epithelium indubitably originated from epithelial cells of mucosa glands, and not from an aberrant germinal deposit. The squamous epithelium was found in the center of the mucosa covering the artificial defect. No squamous cells were found in the surroundings.

Dr. Emil Ries said it was hard for him to conceive why there should be so much difference of opinion regarding metaplasia because embryologically there was no question about such a thing taking place right along normally. He could not see why cells which had such abilities during embryological development should not have such abilities later in life. Ordinarily, defects of epithelium were covered over with the same epithelium that had been there before, with restrictions and limitations. In covering over defects in the uterus, as, for instance, on the placental site after labor, the cells which grew over and covered the defect were ultimately typical columnar epithelial cells. But some research

which the author undertook years ago and which he said had been confirmed in an exhaustive paper by Wormser recently, had demonstrated various kinds of epithelial cells which markedly deviated from the columnar type. Ultimately, however, they returned to the columnar type; through successive phases of metaplasia these cells returned to the normal condition of the surrounding epithelium. The question of metaplasia in organs apart from the question of tumor formation had been particularly interesting to the gynecologist, because of the formation of erosions on the vaginal portion, which had been a much mooted question during many years.

He explained that on the cervix there occurred the formation of columnar epithelium in places where ordinarily stratified epithelium was present. This had been observed repeatedly to occur in islands, so that one could not say that the columnar epithelium from the inside of the uterus had grown out on the vaginal portion and had formed columnar epithelium there, but islands of columnar epithelium were found on the vaginal portion surrounded by stratified epithelium all around. There was no direct connection between the columnar epithelium on the inside of the uterus, and the columnar epithelium in the erosion. It had been said that in these cases we had to deal with remnants of the embryonic columnar epithelium which lined Müller's duct, the rest of the vaginal portion being covered with stratified epithelium, but a few islands had remained over. Under the leadership of Carl Ruge, it was asserted that columnar epithelium forms on stratified epithelium by the process of throwing off all layers except the basal layer, which continued to grow as columnar epithelium. But this would appear hard to prove because the only known function of the basal layer of stratified epithelium was to produce numerous layers different from columnar epithelium. If one scraped off any of the skin surface, and left the basal layer, there would be seen a new formation of stratified epithelium. In this erosion we had a type of metaplasia which had been observed very many times, and on which some experiments had been carried out, particularly with pyroligneous acid, which had been used in the treatment of erosions. If one poured into the speculum pyroligneous acid, allowed it to remain a short time, then removed it, after some few treatments the red color of the surface due to the columnar epithelium became a normally pale pink color. The speaker had seen this in many cases. Cases had been recorded where this experimentation had been carried so far that microscopic sections of the tissues were made before the pyroligneous acid had been applied, and again afterwards, showing that stratified epithelium had formed over these places.

It seemed to the speaker that we were too much limited by the methods of investigation which had thus far been employed, that the chemical side had been left out entirely. Observers had examined these cases histologically and morphologically to the limit; they had built theory after theory on morphological and histological bases, leaving out of consideration the possible chemical influences toward the investigation of which the natural processes ought to have led long before. He was referring now to those cases of metaplasia of organs or tumors which were originally covered with columnar epithelium, and in their continued growth became covered with stratified epithelium. He had removed a few weeks ago a polypus of the uterus from the inside of the uterus, the pedicle of which was attached to the inside of the uterus, so that he felt certain that originally the polypus must have been covered with columnar epithelium. He had found the apex of the polypus covered with stratified epithelium investing completely the part that was hanging out of the vagina exposed to the air. He had made the same observation on hemorrhoidal tumors coming out of the rectum, and hanging out of the anus. One could frequently make a diagnosis of cornification of hemorrhoids macroscopically, because on the tip of the hemorrhoid one could see a white spot, whereas the basal part of the hemorrhoid, the pedicle, was pink. He said there was another way in which stratified epithelium developed on organs where it was not originally found. He had removed a patent thyro-glossal duct. The duct had an opening on the outside where the columnar epithelium came in contact with the stratified epithelium. In this duct he was enabled to follow up the stratified epithelium with horny layers near the skin, to about the length of two centimeters into the duct. This was the same as Dr. Fütterer had mentioned in abscesses. Here there were influences about columnar epithelium which were not usually present, that is, exposure either to the air, or secretions which did not usually surround the epithelium. Taking the case of polypus projecting into the vagina, it was surrounded by the sour vaginal secretion, whereas the secretion inside the uterus was not sour. If a polypus projected more, there was exposure to air. There were processes of disease which sometimes influenced and favored the formation of stratified epithelium. For instance, he had found stratified epithelium in the vas deferens which was covered throughout with columnar epithelium in a case of tuberculosis of the vas deferens and seminal vesicles.

Dr. Fütterer said that Ziegler had found the same thing in tuberculosis of the urinary tract.

Dr. Ries stated that his remarks had reference to the vas deferens; he did not know about the urinary tract. With reference to ozena, mentioned by the essayist, in the cases of stratified epithelium in the body of the uterus, which the speaker had seen, they were also characterized and distinguished by a pronounced fetor. This observation had been made repeatedly, that where the horny epithelium was exposed to infection, it favored the formation of a disagreeable odor, probably because of the disintegration of the horny material. In carcinoma of the uterus, where stratified epithelium was found in the body of the uterus, he had found in the lymphatics belonging to the uterus, which were removed at the operation, glandular ducts which had since been the bone of contention among gynecologists who had been examining these glands microscopically. To explain such ducts, it might be said that the carcinoma of the uterus originated in the glands; that it had made glandular metastases in lymph nodes; these metastases looked like tubular glands, whereas in the uterus itself they had progressed to a different formation, so there would be metaplasia in the uterus and the original type of epithelium in the lymph nodes. The question had become more complicated recently, since it had been found that such glandular ducts in the lymph nodes might be caused by simple inflammatory processes.

The qestion of metaplasia arose again with regard to stratified epithelial carcinomas, many of them with horny products of the uterus. Quite recently he had seen a case of stratified epithelium carcinoma of the body of the uterus in which that diagnosis had been made and on careful examination he thought it was a carcinoma, originating in the columnar epithelium in the uterus, with considerable metaplasia, where the epithelial cells piled up and coalesced, showing many changes of growth that carcinomatous cells were liable to show. It was hard sometimes to say whether a

uterine carcinoma was stratified epithelial carcinoma originally, or stratified from misplaced epithelium, or whether it was ordinary columnar epithelial carcinoma with metaplasia. He had seen carcinoma of the vaginal portion involving the wall of the uterus, leaving the cavity of the uterus entirely free, but the whole cavity was lined with stratified epithelium, not connected at all with the stratified epithelial carcinoma in the wall.

He had observed metaplasia in the uterus in two cases, commonly called ichthyosis uteri. One of them was a woman over fifty years of age, upon whom he operated and extirpated the uterus. He made one curettement and found stratified epithelium. He found no pegs of epithelium going down deep, but the foul-smelling discharge and hemorrhages continued, so that he extirpated the uterus. He found stratified epithelium in the uterus in a case of puerperal infection in a young woman, not extending very high up, but reaching above the internal os. He had found metaplasia in the tube, particularly in tuberculosis, with distinct stratified epithelium. With all these possibilities, he thought it was going too far to assume that every patch of stratified epithelium surrounded by columnar epithelium, or columnar epithelium surrounded by stratified epithelium, must be an aberrant embryonal remnant. He thought the profession were not considering sufficiently the inherent abilities of the cells, and experimentation of the kind carried out by Dr. Fütterer, which would lead to final results, was very much needed. There were many other questions that naturally came up in connection with metaplasia, but the author simply desired to conclude by congratulating Dr. Fütterer on his interesting findings.

Dr. Benton B. Turck stated that when he was a student in Berlin he saw a very interesting case in the nose and throat clinic of Professor Fraenkel, of pachyderma of the vocal cord, the diagnosis having been confirmed by the Professor himself. The patient was a woman who had had frequent injections of iodine and of weak nitrate of silver solutions into the larynx some time before, and the question was raised whether this had not a good deal to do with the origin of the pachyderma of the cord. The woman was markedly anemic, which point was also brought out as a contributing effect, the anemia causing this pachyderma. But the work done by Dr. Fütterer showed that there was a trauma produced first, and in the center of this growth metaplasia occurred. One was almost compelled to accept the findings of Dr. Fütterer as a true metaplasia. In this case I report of pachyderma of the vocal cord chemical trauma undoubtedly played the important rôle. It was supposed to have been the starting-point of the pachyderma in the presence of anemia. One realizes how variable clinical conditions might be, but in the work of Dr. Fütterer one had the absolute experimental proof in the removal of a section, showing the ingrowing of normal glandular tissue and springing almost spontaneously from the center of this was the development of metaplasia.

Dr Fütterer, in closing the discussion, said that the influence of air, as mentioned by Dr. Ries, was a very important factor. In the case he had mentioned of Pollack, there were metastases from cylindrical epithelial carcinoma of the stomach, with squamous epithelial metastases in the lung. He (Pollack) also spoke of the influence of air favoring such changes. Dr. Fütterer thought friction had a great deal to do with the formation of this metaplasia in the most prominent part of the stomach. The mucous membrane was very much thickened and prominent, and there must have been considerable friction between those parts and the food.

OBSTETRICAL SOCIETY OF PHILADELPHIA.

Stated Meeting, April 7, 1904.

The President, Dr. R. C. Norris, in the Chair.

(Continued from Page 432.)

New Modification of Operative Procedure for Retroflexion of the Uterus.—The author of this paper is Dr. E. E. Montgomery; it was read by Dr. John M. Fisher. This is a modification of the operation devised by Ferguson, of Chicago, but to the author's view his method comes nearer securing the desired result than any other he has yet selected. The writer condemns the operation of extraperitoneal shortening of the round ligaments or even the operation of Goldspohn. The method described by the author is one that is very readily performed through a single incision. It affords splendid opportunity for examining and treating the diseased conditions in the pelvis, and gives a fair measure of assurance of the retention of the uteras anteposed. Moreover, it is an operation which uses the natural forces of the uterus and does not add additional band of adhesions within the peritoneal cavity which may be a source of danger to the patient the remainder of her life, as does the operation of ventrosuspension. Furthermore, in the procreating women there is no positive assurance that the band formed in ventrosuspension will not be a source of distress and danger during the progress of her gestation. Besides, it also becomes a source of danger from loops of intestine slipping between it and the fixed uterus becoming strangulated. The author then describes the operation devised by Gilliam and Ferguson, which consists in making the median abdominal incision and drawing and securing the round ligaments through stab wounds in the recti muscle. Then the peritoneum external to the round ligaments is gathered together with a pursestring-like suture and tied. This closes completely the space between the round ligaments and the uterus, therefore prevents the intestine slipping between them. The author's modification of this operation is as follows: The abdomen is opened by median incision. The round ligament is picked up 1½ inches from the cornua of the uterus and a ligature is passed beneath it. Both ends of this ligature are carried by a Deschamps needle through an opening in the peritoneum anterior to the round ligament, to the parietal surface and beneath the parietal peritoneum to a point about the outer margin of the rectus muscle, where it is carried through the peritoneum, muscle and aponeurosis. The ligament on the opposite side is treated in a similar manner. The projecting loops of the ligaments are fastened by sutures to the aponeurosis, the final ones being passed in such a way as to decrease the size of the opening through which the loop was brought. The advantages he claims for this operation are as follows: The womb is maintained in an anterior position; it affords mobility to the organ; it introduces no adhesions nor extraneous material within the abdominal cavity and yet affords structures which will undergo hypertrophy and involution should the woman become pregnant. Moreover, it is of advantage in cases in which there is a tendency to prolapse of the ovary and tube as the relation of the retracted broad ligament to these organs forms a shelf upon which they are more likely to rest. He claims that it is also of service in cases of femoral hernia in that it decreases the directness of the pressure of the intestines on the femoral opening.

Dr. B. C. Hirst, in discussing Dr. Montgomery's second paper, remarked that his experience shows a vast majority of tubal pregnancies bleeding in this way as a tubal abortion, a proportion of nine out of ten at least.

Recent histological examinations explain why this is so. As has been said, the syncytium of the chorion villi or trophoblast eat into the blood vessels of the tubal mucosa. The bleeding comes from the inner wall of the tube, the blood is effused into the lumen of the tube and it has obviously escaped into the abdominal cavity from the abdominal ostium of the tube. In regard to the so-called rupture of the tube in tubal pregnancy; in looking over his whole collection of 68 specimens removed by operation, he doubts if he has a single case in which there has been an actual rupture of the tube in tubal pregnancy from distension. By a process of erosion, the syncytium eats its way to the peritoneal coat, which may then rupture or more likely is eroded like the rest of the tubal wall.

Dr. F. H. Maier, in discussing Dr. Montgomery's third paper, said that he had seen this operation performed quite a number of times, and it is surprising with what ease it is done and in what little time. As Dr. Fisher says, it is simply grasping the round ligament, throwing a ligature around it, making an opening in the peritoneum and carrying it subperitoneally to a point in the lower part of the rectus muscle parallel to the abdominal wound. It can be done almost as quickly as a ventrosuspension. The obstetrician knows that the round ligament and the peritoneum in time, even if they are somewhat distorted and bunched up, will gradually reassert themselves, as is seen in the changes that occur incident to pregnancy. It has distinct advantages over the Gilliam-Ferguson operation, in which, so far as Dr. Maier has seen of that procedure, the greatest trouble is in closing off the vestico-uterine pouch so that there will be no pressing of the intestines around the ligaments when they are drawn up into the lower recti incisions. It is possible to get nearer to the bladder and the peritoneum is bunched more than in this procedure of Dr. Montgomery. In this subperitoneal method there is no secondary suturing and no false ligaments in the peritoneal cavity to predispose to ileus. In displacements of long standing the tubes and ovaries are prolapsed with elongation. Many of these cases need not only suspension of the uterus but of the ovaries as well, and this operation is of advantage in such cases. Of course, as Dr. Montgomery says, it requires time to ascertain the results. It should not be judged hastily. In the Gilliam-Ferguson operation a good many patients returned, complaining of distress in the bladder. This might be due to the intrapelvic peritoneal suturing. Montgomery's method obviates that difficulty and in many ways is a most advantageous procedure.

Dr. P. Brooke Bland said he had no further remarks to make on tubal menstruation or on uterine hemorrhage. He does believe that this operation, devised by Dr. Montgomery, has distinct advantages. The particular advantage is that one uses the strong portion of the round ligaments. It is the only operation upon the ligaments that has this value. In the other operations one utilizes the portions of the round ligaments just as they leave the peritoneal cavity and they are very thin and weak in this region, and, indeed, sometimes cannot be found. Moreover, if shortening of the round ligaments by Alexander's method is contemplated, one has to make two incisions, and being an extraperitoneal operation any diseased condition could not be recognized or treated. Then, too, one may have sloughing of the round ligaments as they leave the abdominal cavity. These may then fall back and carry infectious material with them into the peritoneal cavity. Dr. Bland believes that by this operation, described by Dr. Montgomery, the uterus is successfully retained in a forward position. He does not feel that any operation on the outer portion of the round ligaments will maintain a chronically retrodisplaced uterus in an ante position for any length of time.

Dr. J. M. Fisher said that unfortunately patients are lost sight of after operation. It is difficult, therefore, to determine the value of any given procedure for the restoration of the uterus to its normal position. The question after all is, whether a displaced uterus, in a given case, from a clinical standpoint, is responsible for prevailing symptoms. There is no doubt in his mind that very many never give rise to symptoms, so that, even if the uterus is replaced, there is no change in the condition of the patient. For example, a patient was sent to the Jefferson Hospital to-day suffering from Jacksonian epilepsy. The family physician had found a backward displacement of the uterus and attributed the epilepsy to this condition. The displacement was easily corrected bimanually, and it was quite evident that the epilepsy bore no relation to the displacement. Dr. Fisher has seen most of the procedures that are practised for the correction of backward displacements of the uterus, and this operation, done by Dr. Montgomery, had impressed him very favorably. He has had a number of these operations at the Jefferson. He personally had experience in one case, but the operation was not performed with the same ease as Dr. Montgomery does it now; but Dr. Fisher is sure that after one has mastered the technic it can be done expeditiously. As Dr. Bland has said, the best part of the round ligament is used for the purpose. There are no raw surfaces left in the abdomen after completing the operation. The buttonhole opening in the broad ligament is closed by the round ligament and after this has been fixed to the fascia of the rectus, the anatomical relation of the uterus to surrounding structures is practically that of the organ under normal conditions.

Dr. Norris asked how much puckering there was of the broad ligament after the round ligament has been drawn through and out of the abdominal wall.

Dr. Fisher said that there is some shortening of the broad ligament. As the round ligament is drawn through its anterior leaflet it has some influence upon the tube and may bring about a flexed condition of this structure. As Dr. Montgomery has said, when there is a prolapsed condition of the ovaries and tubes it brings these structures into more favorable positions. A shelf is formed on the posterior aspect of the broad ligament on which the ovary rests. Dr. Fisher has not seen any of the patients after the operation, and is therefore unable to judge of the permanency of the results, but his present impression is that it presents very distinct advantages over every other form of round ligament operation.

Dr. Barton Cooke Hirst made these exhibits: (1) Ehrenfest's Pelvimeter; (2) Schatz's Metranoicter with Modification; (3) A Peculiar Neoplasm in the Puerperal Uterus, Probably of Inflammatory Origin; (4) A Fibroma of the Ovary Completely Calcified; (5) A Report of Experience with the Menge Pessary; (6) Photographs of Vaginal Cyst Stimulating a Cystocele.

(1) Dr. Hirst purchased Ehrenfest's pelvimeter after reading a description of it by its inventor. It is a scientific apparatus enabling one to do what was heretofore impossible in pelvimetry; to draw a diagram of the pelvic shape and size on a sheet of paper outside the woman's body. It gives a graphic representation of the size and shape of any pelvis that one desires to measure. One is not only able to take the anteroposterior but the lateral measurement as well. He thinks it is a useful instrument to have in all large lying-in hospitals where this work should be done in the most scien-

tific manner with the aid of an assistant experienced in pelvimetry. It is a difficult instrument to handle on account of the water level which enables one to keep parallel the lines drawn. Unless the lines are kept parallel the marks do not indicate the true size and shape of the pelvic cavity. It would not be practicable in ordinary private practice. With this instrument is another which Ehrenfest calls his kliseometer, an apparatus for measuring the angle of the pelvis. It is much easier to manipulate than the pelvimeter. Its use is only worth while, however, in very important cases of pelvic deformity, like some extreme examples of rachitis or spondylolisthesis. It is not an instrument suited for the every day use of a general physician.

(2) This instrument has interested Dr. Hirst greatly of late. It is called the Schatz's metranoicter. In looking over German literature he finds a disposition to condemn it. My attention was attracted to it by an article in the *Journal of Gynecology and Obstetrics for the British Empire,* in which an English surgeon said he had found it all that the inventor claimed. This influenced me to give it a trial. Dr. Hirst is pleased with it and believes it will prove an indispensable part of the gynecologist's armamentarium. The profession knows that there are many cases in which one would like to palpate the interior of the uterus, and also knows how difficult it often is to do it. Dr. Hirst has frequently tried to make a digital examination of the uterine cavity after using the ordinary branched dilators, but has usually failed. Uterine tents of sponges, laminaria and tupelo do secure very good dilation, but they are so dangerous that their use is scarcely justifiable. With this metranoicter in place twenty-four hours the forefinger can easily be inserted in the fundus. He has used it in thirteen women; in four for diagnostic purposes; in each it was possible to palpate the interior of the uterus with the utmost ease. If there is anything in dilation of the cervix at all, there must be more in this thorough and permanent kind of dilation than in any other that has heretofore been employed. He has used this instrument nine times for dysmenorrhea and sterility, in the cases in which branched dilators had been used, and he is pleased with the result. Some of these cases were the most severe types of dysmenorrhea; they have all been relieved, one or two in quite a remarkable manner. The operation is begun in the ordinary way by using three branched dilators: (1) Baer's modification of Goodell's two-branched dilator; (2) Wathen's heavy dilator; and (3) the four-branched Cleveland dilator. With the Baer instrument he dilates as much as the instrument allows; with the two-branched dilator an inch and a quarter; with the Cleveland, within 10 mm. of the highest capacity of the instrument; then the metranoicter is slipped in and left in the uterine cavity twenty-four hours. Dr. Hirst believes that this method of dilation will have a widespread use. It occurred to him, however, that Schatz's metranoicter might be somewhat improved, and he has had an instrument-maker make a four-branched instrument instead of the two-branched. He has used the modified metranoicter in one case, and at the end of twelve hours had the widest dilation of the cervical canal that he had ever secured by any plan of artificial dilation. He should have been disposed to criticize this instrument by asking whether it did not occasion unendurable pain. Of the thirteen cases in which it was used there was complaint on only two of pain, and these women, hysterical and neurasthenic, would have complained of pain at its very suggestion, so he thinks the profession may consider the method painless. He could not well dispense with this instrument. It enables him to do safely what he has never been able to do before, and it will, he believes, have a wide field of usefulness in practice.

(3) The next exhibit is an illustration of a case which Dr. Hirst thinks must give the profession serious cause for thought. His predicament in this case was one in which any one may find himself occasionally. He was called to see a woman who had been bleeding profusely for four days. She had been delivered at 6½ months, ten days before, and had had several hemorrhages during pregnancy. She was transferred to the hospital in an exsanguine condition. She was brought before the class in a clinic at the University, and served as a text for a lecture upon hemorrhage in the puerperum. The attention of the students was called to its possible causes, including malignant growths, but they were warned to think of the commoner causes first, and of malignancy last of all, as the rarest. On exploring the uterus, however, with curette forceps, in addition to placental fragments, material was removed of a brain-like consistency, such as is obtained from a case of adenocarcinoma. It was submitted to three different pathologists. They all agreed that it was exceedingly suspicious. One made a diagnosis of coritoepithelioma; another concurred, but with some reservation. The third disagreed, but admitted the possibility of malignant growth. They all recommended hysterectomy as a result of their study of the specimens. The uterus was accordingly removed. A neoplasm is shown, not at the placental site, and apparently of an inflammatory nature. It showed round-cell and leucocyte infiltration, with necrosis. There is no infiltration or hyperplasia of cyncytial cells, though the scrapings showed this plainly. It is a question whether it was a localized barrier against an incipient chorio-epithelioma. This case illustrates the difficulties in the diagnosis of chorio-epithelioma, before the disease has advanced to an inoperable stage.

In all cases of retained placental fragments and endometritis after labor, there is likely to be syncytial hyperplasia and infiltration of the myometrium by syncytial cells. How can one tell when the physiological limit has been passed and epithelial overgrowth has become malignant? When a large, vascular, friable mass has developed in utero, breaking down under the finger, and exhibiting a vast overgrowth of the syncytium, the diagnosis is plain enough, but how to make it in the earliest stage of the disease, he confesses he is at a loss; and yet, in no variety of malignant growths in the uterus is an early diagnosis so desirable. The mistake must occasionally be made, in the present stage of our knowledge of doing hysterectomy for what is regarded to be a malignant growth, when malignancy is not yet clearly established. The condition is a rare one and the dilemma does not often confront the profession, but when it does, he thinks one may feel puzzled and must acknowledge that a mistake is liable to be made. The patient in this case made a perfect recovery.

(4) The next specimen is an interesting one, of fibroma of the ovary. It has undergone complete calcification, and has the appearance as well as the feel of a cobblestone. The diagnosis before operation was calcification of a superitoneal fibroma. There was no ascites. It is an interesting question, whether calcification prevents ascites or not. The woman had suffered from the mechanical "insults" to surrounding structures from this freely mobile, stony-hard tumor in the abdomen. She made a good recovery.

(5) The next exhibit is Menge's pessary for prolapsus uteri. Certain women cannot or will not be operated on for prolapsus, and the task is imposed on the profession of keeping up the utera by some mechanical support. Dr. Hirst supposes, like most of the mem-

bers, he has tried every device in the instrument-makers' shops with more or less dissatisfaction, until he used this pessary of Menge's, described in the *Centralblat für Gynekologie*, a few months ago. He has had an opportunity, lately, to use the support with unlooked-for good results in some difficult cases. One woman had an enormous total prolapse of the uterus with severe pruritis vulvæ, the result of diabetes mellitus. She had more than five per cent. of sugar in the urine and was over sixty-five years of age. An operation would naturally have been unjustifiable. For the first time in several years the uterus remains at a normal level within the pelvis, the woman is comfortable and her pruritis is nearly cured. In short, the pessary has been a perfect success. In another case of total prolapse the woman had been operated on twice by other surgeons with complete failure. She positively declined another operation. In her case also the result with Menge's pessary has been satisfactory. The principle of the pessary is that it is kept in a transverse position in the vagina by the projection below somewhat on the principle of the fin keel of a boat. Several devices with this end in view have been proposed, but Dr. Hirst has found none so satisfactory as Menge's. The patient should be instructed to remove the pessary every night or every other night and to reinsert it in the morning. Its removal is facilitated by the detachment of the projection, which should be joined to the ring before the instrument is reinserted. Unless the pessary is removed at frequent intervals it has the disadvantage of all ring pessaries; it irritates the vaginal walls and causes ultimately extensive ulceration.

AMERICAN PROCTOLOGIC SOCIETY.

Sixth Annual Meeting at Atlantic City, June 8 and 9, 1904.

The President, Wm. M. Beach, M.D., of Pittsburg, in the Chair.

Things of Specialism and of This Society That Make for Optimism.—This was the text of the presidential address, and was a thoughtful and well-considered argument in support of specialism in general and of proctology in particular. He pointed out that the favorable recognition which had been accorded this specialty was largely due to this Society, and that as a direct result, though only six years old, the advertising charlatan had practically disappeared. The high type of men composing the membership was alluded to, and the continued exercise of careful circumspection in admitting new members advocated.

Surgical Treatment of Prolapse of the Rectum.—This was the subject of remarks by Dr. J. M. Mathews, of Louisville, in which he reported excellent results from drawing up the colon and suturing it to the abdominal wall. He had resorted to the method in a number of cases and believed the operation, colopexy, worthy of more general adoption.

Treatment of Pruritus Ani With the Roentgen Rays.—This subject was discussed by Dr. J. R. Pennington, of Chicago. From an experience covering a period of several years he had reached the conclusion that the X-rays were a valuable therapeutic measure in certain obstinate cases in which no cause for the pruritus is discoverable, and in which the secondary changes in the parts affected are most marked. He had succeeded in a number of instances in effecting a cure after every other form of treatment had failed.

The Present Status of the Treatment of Cancer of the Rectum.—This was the title of a paper by Dr. Lewis H. Adler, of Philadelphia. He considered four methods of treatment: (1) the X-rays, (2) radium, (3) extirpation, (4) colostomy. Speaking from his own experience he condemned both the first two mentioned, the X-rays, as aggravating the disease and apparently hastening death, the radium as being non-effective. With reference to extirpation he said that cancer of the rectum, at the stage usually discovered by the surgeon, is far less amenable to operative treatment than cancer occurring elsewhere; that extirpation, even when thorough, is followed by cure in only a small percentage of cases, owing frequently to prior metastasies; that the danger attending excision of the growths situated above the lower two or three inches is very great; and that the results as to freedom from pain in successful cases are usually far from satisfactory. He personally had been unable to advise excision in more than five per cent. of cases. Colostomy the author regarded a valuable palliative operation, the patient living in comparative comfort an average of three to four years. Personally he does not advise colostomy as early now as formerly.

The Flexible Rectal Tube.—This instrument was condemned by Dr. S. T. Earle, of Baltimore, as impracticable and of limited utility. His investigations of the subject had led him to conclude that as ordinarily employed by nurse or patient, the instrument curls upon itself in the lower rectal chamber and very rarely enters into the sigmoid. This difficulty may be overcome in a measure by attaching nozzle of fountain syringe to tube and allowing enough water to enter the bowel to distend it in front of advancing tube. In inexpert hands the instrument is capable of harm and except in the hands of the physician himself, the writer thought it should give place to the ordinary anema nozzle and elevation of patient's hips, by which method the same results can generally be obtained.

Poly-adenomata of the Rectum.—Dr. G. B. Evans, Dayton, O., presented this paper, in which he referred to the comparative varity of the disease and emphasized the importance of early and complete removal of the tumors, their tendency to undergo malignant changes being the chief danger. With the more general employment of instruments of precision in rectal examinations the writer predicted that polypi would be more frequently encountered in future.

Some Observations on the Treatment of Rectal Diseases.—Dr. W. L. Dickinson, of Saginaw, Mich., spoke of the great prominence diseases of the rectum had gained in the past 25 years. When he was a student the entire subject was disposed of in one lecture by the professor of surgery, "piles," being the only disease alluded to. Improvements in the office treatment of these conditions were discussed at some length, the author showing that it is possible in a large number of cases to do good, thorough work without general anesthesia and confinement of patient to bed.

Rectal Valves with Report of Operative Cases.—This was the title of an essay by Dr. L. J. Krouse, of Cincinnati. The author discussed the indications for valvotomy and endorsed it as a justifiable operation in properly selected cases, reporting a series of cases in which great and permanent benefit had followed its performance.

Treatment of Simple Rectal Fistula by Excision and Suture Without Cutting the External Sphincter Muscle.—Dr. Howard A. Kelly, of Baltimore, read this paper, in which he described the technic of an operation devised by himself and successfully employed in a number of cases. The procedure is applicable only when the fistula is simple and direct and consists of dissecting out the tract, beginning at the external opening. The rectal orifice is then carefully excised through the

wound so as to make a transverse opening parallel to the sphincter fibers. The wound is then closed by interrupted silkworm-gut or silver wire sutures, taking care to draw the circular fibers together above and below the rectal orifice.

Sterile Water Anesthesia in the Radical Treatment of Rectal Diseases.—This was the subject of a paper by Dr. S. G. Gant, of New York. In the author's opinion the hospital, general anesthesia, and confinement to bed constituted a routine, which, as applied to rectal diseases, was both unnecessary and unjustifiable in most instances. For several years he had been seeking means to overcome these disadvantages. After trying various agents for producing local anesthesia he had abandoned them one after another because of toxic effects, hemorrhage, pain or non-effectiveness. Finally he concluded that the anesthetic effect of these agents was due rather to pressure than to the drugs employed and was led to try sterile water alone. This gave him the happiest results. He reported 320 cases operated upon by this method, which included practically every variety of rectal disease amenable to operative treatment. The results had been so gratifying that he heartily recommended that the method be given a trial by other surgeons.

Papers by Dr. Leon Strauss, of St. Louis, and Dr. A. Tierlinck, of Gand, Belgium, in the absence of the authors, were read by title.

Officers.—The following officers were elected, after which the Society adjourned to meet in Pittsburg, May, 1905: President, Dr. J. R. Pennington, Chicago; Vice-President, Dr. L. H. Adler, Philadelphia; Secretary-Treasurer, Dr. A. B. Cooke, Nashville. Executive Council, Dr. W. M. Beach, Pittsburg; Dr. S. G. Gant, New York, and Dr. G. B. Evans, Dayton.

BRITISH MEDICAL ASSOCIATION.[1]

Seventy-second Annual Meeting, held at Oxford, England, July 26, 27, 28 and 29, 1904.

(Continued from Page 427.)

SECTION ON TROPICAL DISEASES.

Some Fallacies in Finalities.—This was the title of the address of the President of the section, Brig.-Surg. Alexander Crombie. He spoke of the modifications brought about in the investigations of many tropical diseases and pointed out the fallacies of many currently adopted opinions.

Malarial Fevers.—The criticisms of clinicians have, on the whole, been favorable to the belief in the occurrence in hot climates of fevers of a continued type other than typhoid and malarial remittents, but the opinions of our laboratory confrères have been almost uncompromisingly opposed to it. In a conversation he had last year at Liverpool, one expressed himself as having found no evidence of their existence, and Leonard Rogers, in a paper which he read before the Medico-Chirurgical Society in May last year, was still more emphatic. Quite recently, however, opinions have been expressed more in unison with clinical observation, and he thought it would be profitable to examine the grounds on which the laboratory opposition rested. Notwithstanding official returns to the contrary, which show an overwhelming majority of admissions for malarial fevers, "ague" is not the most prevalent type of fever in any of the parts of India where he practised his profession. The commonest type of fever is what he has elsewhere called a "single-paroxysm fever." The paroxysm may be of a few hours or a few days' duration, but it is a single paroxysm, and has no tendency to recur. If it lasts a few hours it is called "ephemeral fever," if a day or two it is called "febricula," if several days it is known as "simple continued fever." These attacks of fever give no clinical evidence of periodicity such as is caused by the life-cycle of a parasite renewing itself at frequent intervals in the blood. He failed to find the malarial parasite in such cases, and they recovered without quinine. But since his paper was written these cases of a single pyrexial paroxysm have, nevertheless, been by many regarded as essentially malarial in their nature. Rogers sounds no uncertain note on this subject. He says they are all malarial, as shown by a microscopical examination of the blood and an analysis of the symptoms. Several of his cases, he says, had a typical tertian character, each of them showed the mononuclear increase of malaria, and they were each cured by quinine. But he does not say that he found the malarial parasite present in any of them; neither is the fact that they each recovered after quinine evidence that they were malarial in nature, because they are essentially fevers of a single pyrexial paroxysm, and recover equally well without quinine as with it. There remains the one evidence of the mononuclear increase, but as this can no longer be held to be conclusive of recent malarial infection, nothing remains to support the contention that these cases of fever of a single paroxysm are all of a malarial nature. Quite recently James wrote as follows: "It is certain that other fevers than malaria are often returned under the term 'ague.' In order to ascertain what proportion of the admissions were really due to malaria, a number of men admitted for this disease were examined in October, 1901, by Dr. Christophers" (that is, in Mian Mir, the most malarious cantonment in India, and at the most malarious season) "and in 40 per cent. of these malarial parasites were found. In the same way he examined a number of men admitted or detained for ague during September, 1902, before any quinine had been administered to them, and found malarial parasites in 45 per cent. of the cases examined. During this month, also, through the courtesy of Major Gordon Hall, R.A.M.C., no quinine was administered as medicine to a number of cases in which he had not found parasites. All of them recovered in from one to three days, without any quinine treatment, and from this and the fact that several examinations in each case failed to show the presence of parasites, he concluded that these cases of fever were not due to malaria, though usually entered as such in the returns." Similarly, writing in Bombay in February, 1904, Mr. Arthur Powell bears testimony to the same effect. Thus he says: "Slight fever, for which no specific cause has been detected by me, is not uncommon in Europeans who have been a short time in the country. He had failed to find any malarial parasites in many such cases, and to test the theory that these are malarial, with a sparse infection, he had withheld quinine to see if a relapse would occur; no such recurrence has taken place."

One can therefore conclude that a large proportion of the febrile attacks of hot climates must still be included in the terms "febricula" and "simple continued fever," and that the evidence that they are all malarial is inadmissible. He then took a form of fever which he had called "non-malarial remittent." This was a fever of considerable severity, duration and mortality, lasting on an average six weeks, if not fatal at an earlier period. He had never been able to find malarial parasites in such patients, and quinine sometimes pushed to the extreme dosage of 90 gr. a day (6 grams) was not only ineffectual, but obviously harmful. In the discussion that followed the reading of his paper at the Edinburgh

1 From advance sheets of the *British Medical Journal*, by courtesy to the editors.

meeting of this Association, it was contended by the late Dr. Hughes, and by Dr. Edmonston Charles, who was well acquainted with this form of fever in Calcutta, and who had also made a study of Malta fever, that this "non-malarial remittent" was in reality Mediterranean fever. Dr. Crombie had seen some twenty cases of Malta fever in the wards of the General Hospital, Calcutta, landed from a man-of-war which had come straight from the Mediterranean, and their clinical picture was different from his patients. His confidence was somewhat shaken when it was announced about the time of the Edinburgh meeting that the sedimentation test for Malta fever had been successfully applied to cases of fever from Dugshai and elsewhere in Northern India, and even in cases from Calcutta; and a short time ago it was announced that agglutination occurred in every specimen of blood sent from fever cases in Assam, and that, in fact, kala-azar was epidemic Malta fever—a theory which has now been abandoned. What, then, is this form of fever which he described as occurring in India under the name of "non-malarial remittent?" Rogers, in his paper, came to the conclusion that it did not exist, although at the beginning of his investigations he believed in its existence, and was stimulated to try to find its true cause. He was driven to the conclusion as the result of his study of continued and remittent fever, by modern blood tests, that only two forms of fever exist in Lower Bengal, at any rate, of long duration, namely, typhoid and malarial remittents. A considerable portion of the cases could be distinguished, he said, by purely clinical methods, and the remainder by the serum test or by the differential leucocyte count, in all but a very few cases. The so-called "non-malarial remittent" in natives was, according to him, shown by the serum test to be nothing but typhoid fever. Unfortunately for this pronouncement, the ink with which it was written was hardly dry when Leishman made the discovery of the bodies, now associated with his name, in the spleens of cases of fever from Dum-dum which were neither malarial nor typhoid, and cases of identical character associated neither with malaria nor typhoid have now been reported from Sylhet, from China, from Tunis, from Egypt and the Soudan, from Madras, where they form 7 per cent. of the total native admissions to hospital, and kala-azar, which Rogers strove to prove to be a contagious form of malarial fever, is now shown to be a form of "non-malarial remittent" associated with the same bodies.

He said he did not bring these points out as a parade of superior clinical sagacity. He made no such claim, for two reasons: first, because the knowledge that has from time to time to deal with cases which could be classed neither with typhoid nor malarial fevers was common property among clinicians of his day, before "modern methods" cast a doubt on the existence of what has habitually been called "non-malarial remittent," and it was only his fortune to voice this conviction; and secondly, because the clinical character of the cases associated with Leishman's bodies is very often apparently entirely different from that of the fever which, in his address of 1894, he described under that name. His object was to point out the fallacies which lay in the way of investigators, and turn them aside from the path on which some of them set out with a clear object in view, and which would, if pursued with more imagination and stricter logic, have surely led them to the discovery of the existence of this class of fevers which they have hitherto denied.

The fallacy, he said, was the fallacy of finality, the fallacy that every step made in advance is final and that every fact of medicine must be brought into line with it for the reason that there is nothing beyond. It is a fallacy which has mired the progress of medicine ever since it started on its journey. To go no further back than the middle of last century, we find that previous to that time there was only one kind of non-malarial fever, and that that was typhus. In vain did clinicians and pathologists point out, and none more clearly than Scriven, of the General Hospital in Calcutta, and Annersley, of Madras, in 1835, that there existed another type of fever of more insidious character and accompanied by ulcerations of the small intestine, which was clinically and pathologically distinct. It was not till fourteen years later, when Jenner's classical labors showed it to European practitioners, that they had ears to hear and eyes to see that the "typhoid" fever of the English, the abdominal typhus of the Continent, was a distinct pathological and clinical entity. But it was thought this step was final: every fever that was not malarial must be either typhus or enteric, and Mediterranean fever had to be included in one or other of these categories, and we accordingly find even Laveran, in the early editions of his great work on *Paludisme*, classifying it in this way, notwithstanding its striking divergence clinically from either malarial or typhoid fevers. Then came Bruce to show us that it was as distinct bacteriologically as it was clinically and pathologically from either. At last the end of everything was reached, and every fever that was not malarial or typhoid was Malta fever, as was maintained at the Edinburgh meeting, and in proof of this opinion came reports of serum tests from Upper India and Assam entirely corroborative of it, and it was clinched by the discovery of the clinical significance of the leucocyte count. Rogers was the great apostle of the leucocyte count, and his whole argument in the paper he read last year was based on the opinion that "by this means alone, in the great majority of cases, a correct diagnosis can be arrived at by the examination of stained blood-films with an ordinary high-power lens." He had arrived at finality; an increase of the percentage of lymphocytes indicated typhoid, and of the large mononuclears, malarial fever. The presence of the malarial parasite was of little comparative importance, and, in fact, he only found it in less than 25 per cent. of the cases he diagnosed as malarial by the differential leucocyte count. Further, he said: "I am far from disparaging the value of this method of investigation, and I use it constantly, but I use it with caution, because it has been found that the presence of an increased percentage of mononuclears is not confined to malarial infection. It has been found in the spotted fever of the Rocky Mountains, in the fever of trypanosomiasis, in black water fever, and in that associated with Leishman's bodies. It has indeed been abandoned by Rogers himself, for in a recent communication he says that 'if the new bodies are not a form of malarial organism, then it is evident that a large mononuclear increase is not diagnostic of malaria, but rather an indication of the presence of a protozoal as opposed to a bacterial invasion of the system,' and his whole argument as to the non-existence of a 'non-malarial remittent' fever crumbles before his own breath. But that is not all. Even if we admit that it is evidence of a protozoal infection, it is not incontrovertible evidence of an active or even recent protozoal infection. The question of the duration of the mononuclear increase after an attack of ague is one which is of the greatest importance in this relationship, and I have evidence that it may continue for a very considerable period. In a case of insomnia which I have now under observation the large mononuclears constituted 24 per cent. of the total leucocytes in October, 1903, and again in July, 1904, although the last

possible malarial infection was at Delagoa Bay in April, 1902, so that, apparently, this phenomenon may continue for over two years, and possibly much longer, and cannot, therefore, be regarded in a malarial country as evidence of present, or even recent, malarial infection, putting aside the consideration that it occurs in other febrile conditions.

Widal Test Not Conclusive.—It may seem hypercritical to apply similar reasoning to the arguments which have been brought forward to prove that this so-called 'non-malarial remittent' is nothing more than typhoid. I require something more than an increased percentage of lymphocytes, or even the Widal reaction, to convince me that enteric is a common fever among natives of Lower Bengal. It has yet to be proved that typhoid is the only fever in which an increased lymphocyte percentage occurs, and until that is done all argument founded on that assumption is a mere begging of the question, irrespective of Rogers' admission that it was absent in one-third of the cases so diagnosed by him. I must also demur to accepting a positive Widal reaction as conclusive of active typhoidal infection in any given case of fever in a native of Bengal. As with the mononuclear increase in malarial, or rather protozoal, infection, so the phenomenon of agglutination may occur under other conditions, and is often of long and indefinite duration. Though it is lost as a rule in a few months after an attack of typhoid, it may persist for twenty-five years, according to Horton Smith, so that any case of fever occurring within an indefinite period after recovery from this fever may give the reaction without any fresh infection by the bacillus of Eberth having occurred. It is even an unjustifiable assumption that a previous attack of typhoid fever is necessary for the manifestation of the reaction in natives of Lower Bengal who give no history of any fever which could be regarded as having been typhoidal. This is a point on which Freyer, of the R.A.M.C., was the first to sound a warning note. I am aware that the dilution he used was too low, and that healthy blood sometimes gives positive evidence of the agglutination in 1 in 12. I am also aware of the negative results obtained by Lamb, of Bombay, who used the sedimentation test, but I think it desirable to put on record those which I obtained in examining the blood of healthy natives of India living in London. I sent specimens of the blood of eleven such natives to Mr. Bokenham, Dr. Klein, and Captain Hayward Pinch of the Polyclinic, as I was in the habit of doing in ordinary clinical work unconnected with this inquiry. In six of these the result was entirely negative, but of these three were over forty years of age, two were natives of the Punjab, and only one was a young Bengali. The remaining five were young natives of Lower Bengal or Assam, studying law or medicine in England. When not otherwise stated the dilution was 1 in 50. Of these two gave a marked reaction in twenty minutes; three gave the reaction slowly, showing many clumps in half-an-hour, two of them giving a marked reaction in dilutions of 1 in 30. In two instances the blood was re-examined after an interval of six months. In one there was 'distinct partial clumping in thirty minutes, better still in one hour in a dilution of 1 in 20' (Klein). In the other there was no sedimentation with a typhoid culture, 'but in a hanging-drop preparation made with the typhoid culture a distinct loss of motility—as contrasted with a control slide—was noticed in three hours and at the end of five and a half hours all movement had ceased, but there was not the slightest attempt at agglutination. This certainly does suggest that the blood contained some substance inimical to the vitality of the typhoid bacillus' (Pinch). None of these young men had a history of fever which could be regarded as indicating recent typhoid infection, and yet there were present in their blood substances which are regarded in ordinary laboratory work as indicative of present or recent typhoid infection, and I think we must therefore accept with reserve the opinion formed on the serum reaction alone, that typhoid fever is a common form of fever in natives of lower Bengal, in the face of these results and the experience of many medical officers who have regarded it as rare, an experience grounded not only on clinical observation, but on necropsy."

In his address of 1894 he said he had spoken of Bastard Typhoid, a continued fever, which ran the course of a mild typhoid, of from three to four weeks' duration, but which had none of the clinical symptoms of that disease. It had been recognized as a peculiar type in all the larger towns of India, where it was known by the local names of "Calcutta fever," "Bombay fever," etc. In the absence of specific evidence that it was no other than typhoid, clinicians declined to give it this name, although they treated it as such. He provisionally called it "urban fever" in 1894, but is now prepared to regard it as a peculiar form of typhoid, and in my paper in the *Encyclopedia Medica* had suggested the alternative name of "Bastard Typhoid." His reasons for advancing it to this category are that in one case which he had an opportunity of examining before he left Calcutta he obtained the Widal reaction, and as this is a fever of Europeans, the same objection does not exist to accepting this evidence as it does in the case of natives. Rogers also states that he found this reaction in every case of continued fever in the wards of the European General Hospital. It would have been more satisfactory if he had sorted the cases clinically, so as to have been able to make it quite clear that his enumeration included cases of this type, for the fact that they conform to the serum reaction of typhoid fever in no way alters the fact that they exist as a distinct clinical type. It has been demonstrated that there are several types of enteric fever, and a form which does not give the serum reaction in any period of its course has been pointed out under the name of "Paratyphoid." And he thought that the distinct clinical type which is so well recognized in India, and which he has called "Bastard Typhoid," ought not to be dismissed because it gives the serum reaction, but its peculiar clinical features rather mark it for more exact research. His experience in connection with the typhoid fever of the South African war, which showed several very distinct deviations from the ordinary classical enteric of the text-books, namely, the often copious eruption, the frequency of thrombosis and of muco-enteritis as a sequela, has led him to think that typhoid fever is generally a mixed infection, the symptoms and severity varying with the amount and quality of the mixture, and it is not impossible that the peculiar type which occurs in the large cities of India may turn out to be a pure infection with Eberth's bacillus, and may thus form the bed-rock on which the more classical cases are built up by additions of other intestinal flora.

(To be Continued.)

Medical Society of the State of New York.—The following have been appointed the Business Committee of the Medical Society of the State of New York, by the President, Dr. H. D. Wey: Dr. Henry Flood, of Elmira; Dr. A. Edward Davis, of New York, and Dr. Leo H. Neuman, of Albany. Those interested in the program of the next annual meeting of the Society, to be held in Albany January 31, February 1 and 2, next, will communicate with them, as they are charged with its preparation.